TL
501
S42

VOLUME 23/ NUMBER 7
APRIL 8, 1985
ACC. NOS. N85-15657 TO N85-16730

STAR

AN ABSTRACT JOURNAL

THE UNIVERSITY OF MICHIGAN
MAY 06 1985
ENGINEERING LIBRARY

Scientific and Technical Aerospace Reports

PRODUCED BY THE
SCIENTIFIC AND TECHNICAL
INFORMATION
BRANCH

NASA

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WHAT YOU CAN DO FOR *STAR*

All users of this abstract service are urged to forward reports to be considered for announcement in *STAR*. This will aid NASA in its efforts to provide the fullest possible coverage of all scientific and technical publications that might support aeronautics and space research and development. If you have prepared relevant reports (other than those that you will transmit to NASA, DoD, or DOE through the usual contract- or grant-reporting channels), please send them for consideration to the NASA Scientific and Technical Information Facility, P.O. Box 8757, B.W.I. Airport, Maryland 21240.

Reprints of journal articles, book chapters, and conference papers are also welcome. These will be considered for announcement in *STAR's* companion journal, *International Aerospace Abstracts*.

You may specify a particular source to be included in a report announcement if you wish; otherwise the report will be placed on public sale at the National Technical Information Service. Copyrighted publications will be announced but not distributed or sold.

PURCHASE OF *STAR*

The semimonthly issues are available for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

PUBLISHED BY:

UNITED STATES GOVERNMENT
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
SCIENTIFIC AND TECHNICAL INFORMATION BRANCH
Scientific and Technical Aerospace Reports, Volume 23, is prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by PRC Government Information Systems.

The Administrator of the National Aeronautics and Space Administration has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Agency. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through February 28, 1985.

US ISSN 0036-8741

INTRODUCTION

Scientific and Technical Aerospace Reports (STAR) is a major component of a comprehensive National Aeronautics and Space Administration information system covering aeronautics, space, and supporting disciplines. *STAR* is issued on the 8th and 23rd of each month and announces current publications of the following types:

- NASA, NASA contractor, and NASA grantee reports
- Reports issued by other U.S. Government agencies, domestic and foreign institutions, universities, and private firms
- Translations in report form
- NASA-owned patents and patent applications
- Dissertations and theses

THE UNIVERSITY OF MICHIGAN
MAY 06 1985
ENGINEERING LIBRARY

Cumulative index volumes are published annually.

Journal, book, and conference literature, cover-to-cover journal translations, and certain foreign dissertations are announced in a companion journal, *International Aerospace Abstracts (IAA)*, available on subscription from the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

SUBJECT SCOPE

Subject scope of *STAR*, and *IAA* includes all aspects of aeronautics and space research and development, supporting basic and applied research, and applications. Aerospace aspects of earth resources, energy development, conservation, oceanography, environmental protection, urban transportation, and other topics of high national priority are also covered.

OTHER NASA PUBLICATIONS

Other NASA publications and information services are described in the publication, *The NASA Scientific and Technical Information System ... and How to Use It*, available without charge from the NASA Scientific and Technical Information Facility, P.O. Box 8757, B.W.I. Airport, Maryland 21240.

HOW TO USE *STAR* SUBJECT CATEGORIES

STAR is categorized by 10 major subject divisions divided into 74 specific subject categories and one general category/division. The major subject divisions are listed in the Table of Contents, together with a note for each that defines its scope and provides any cross-references. For example:

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics*.

Each major division is further divided into as many as nine specific categories, which are identified by category numbers.

Abstracts in *STAR* are grouped by specific category, the categories appearing in sequential order. Category breaks in the abstract section are identified by the category number and title, and a scope note. Cross-references to other categories are provided as appropriate. For example:

02 AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer*.

CROSS-REFERENCES

Individual *STAR* abstracts are not ordinarily cross-referenced, except for certain conference reports or book translations that have had separate abstracts written for their component papers or chapters. Citations and abstracts of the components follow immediately after those of the parent document. When the subject content of a component differs sufficiently from the general content of the parent, a cross-reference citation also is printed at the end of the category to which it normally would have been assigned if it were independent.

DOCUMENTS ON MICROFICHE

Documents on microfiche(1) are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

AVAILABILITIES

One or more sources from which a document announced in *STAR* is available to the public is given in each citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code following the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page vii.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, as indicated above, for those documents identified by a # symbol.)

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Adminstration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its' Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.

Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this Introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.

Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)

Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free. (See discussion of patents and patent applications below.)

Avail: ESDU. Pricing information on specific data, computer programs, and details on ESDU topic categories can be obtained from ESDU International Ltd. Requesters in North America should use the Virginia address while all other requesters should use the London address, both of which are on page vi.

NASA PATENTS AND PATENT APPLICATIONS

Patents and patent applications owned by NASA are announced in *STAR* under appropriate subject categories and are referenced in the *STAR* indexes. In the Report/Accession Number Index, patents are indexed by the NASA Case Number (which appears in lieu of the report number in other indexes), the U.S. Patent Number, the U.S. Patent Application Serial Number, and the U.S. Patent Class. Patent applications for which patents have not yet been issued are indexed by the NASA Case Number and the U.S. Patent Application Serial Number.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($7.00 domestic; $14.00 foreign). Microfiche are sold at price code A01 ($4.50 domestic; $9.00 foreign). The US-Patent-Appl-SN- number should be used in ordering either paper copy or microfiche from NTIS. Printed copies of *patents* (which are not microfiched) are available for purchase at 50 cents per copy from:

Commissioner of Patents and Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office. The patents and patent applications announced in *STAR* are owned by NASA and are available for royalty-free licensing. Requests for licensing terms and further information should be addressed to:

Assistant General Counsel for Patent Matters/Code GP-1
National Aeronautics and Space Administration
Washington, D.C. 20546

ELIGIBILITY AND REGISTRATION FOR NASA INFORMATION PRODUCTS AND SERVICES

A variety of services is available to organizations of the following types that have registered with NASA to receive specific services or products:

1. NASA offices, research centers, contractors, subcontractors, grantees, and consultants;
2. Other U.S. Government agencies and their contractors;
3. Libraries in the United States that have arrangements with NASA to maintain collections of NASA documents for public reference;
4. Other organizations in the United States having a need for NASA documents in work related to aeronautics and space research;
5. Organizations abroad that have established reciprocal document exchange arrangements with NASA.

Only the central service points or central points of document acquisition and control within qualified organizations are eligible to register for NASA products and services. Domestic organizations that may be eligible to receive various classes of NASA publications and services should address their requests for registration or for further information to:

NASA Scientific and Technical Information Facility
ATTN: Registration Activity
P.O. Box 8757
B.W.I. Airport, Maryland 21240

Organizations abroad should direct requests to the same address, but to the attention of: International Exchange Program.

AVAILABILITY OF *STAR* ABSTRACTS ON MICROFICHE

Microfiche of the abstract sections of this issue and other issues of *STAR* are available on annual subscription from NTIS, Attn: Subscriptions, 5285 Port Royal Road, Springfield, Virginia 22161. Annual subscription rates are $60.00 North America; $120.00 foreign. Abstract sections for previous years retroactive to 1964 are available at the current rates. Microfiche for individual *STAR* issue abstract sections are not available.

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC: NASA and NASA-sponsored documents and a large number of aerospace publications are available to the public for reference purposes at the library maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN: An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *Star*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols # and * from ESA - Information Retrieval Service European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.

FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 50 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. Over 1,300 other depositories also exist. A list of the regional GPO libraries appears on the inside back cover of *STAR*.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

Department of Energy
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

ESDU International, Ltd.
1495 Chain Bridge Road
McLean, Virginia 22101

ESDU International, Ltd.
251-259 Regent Street
London, W1R 7AD, England

Fachinformationszentrum Energie, Physik, Mathematik GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information Facility
P.O. Box 8757
B.W.I. Airport, Maryland 21240

National Aeronautics and Space Administration
Scientific and Technical Information Branch (NIT-1)
Washington, D.C. 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey Library
National Center – MS 950
12201 Sunrise Valley Drive
Reston, Virginia 22092

U.S. Geological Survey Library
2255 North Gemini Drive
Flagstaff, Arizona 86001

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U.S. Geological Survey Library
Box 25046
Denver Federal Center, MS 914
Denver, Colorado 80225

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1983)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 4.50	$ 9.00
A02	001-025	7.00	14.00
A03	026-050	8.50	17.00
A04	051-075	10.00	20.00
A05	076-100	11.50	23.00
A06	101-125	13.00	26.00
A07	126-150	14.50	29.00
A08	151-175	16.00	32.00
A09	176-200	17.50	35.00
A10	201-225	19.00	38.00
A11	226-250	20.50	41.00
A12	251-275	22.00	44.00
A13	276-300	23.50	47.00
A14	301-325	25.00	50.00
A15	326-350	26.50	53.00
A16	351-375	28.00	56.00
A17	376-400	29.50	59.00
A18	401-425	31.00	62.00
A19	426-450	32.50	65.00
A20	451-475	34.00	68.00
A21	476-500	35.50	71.00
A22	501-525	37.00	74.00
A23	526-550	38.50	77.00
A24	551-575	40.00	80.00
A25	576-600	41.50	83.00
A99	601-up	-1	-2

1/ Add $1.50 for each additional 25 page increment or portion thereof for 601 pages up.

2/ Add $3.00 for each additional 25 page increment or portion thereof for 601 pages and more.

Schedule E

EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

Price Code	North American Price	Foreign Price
E01	$ 6.50	$ 13.50
E02	7.50	15.50
E03	9.50	19.50
E04	11.50	23.50
E05	13.50	27.50
E06	15.50	31.50
E07	17.50	35.50
E08	19.50	39.50
E09	21.50	43.50
E10	23.50	47.50
E11	25.50	51.50
E12	28.50	57.50
E13	31.50	63.50
E14	34.50	69.50
E15	37.50	75.50
E16	40.50	81.50
E17	43.50	88.50
E18	46.50	93.50
E19	51.50	102.50
E20	61.50	123.50
E-99 - Write for quote		
N01	35.00	45.00

VOLUME 23 NUMBER 7 APRIL 8, 1985

TABLE OF CONTENTS

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics*.

01 AERONAUTICS (GENERAL) 893

02 AERODYNAMICS 897

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer*

03 AIR TRANSPORTATION AND SAFETY 899

Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation.*

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION 900

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Spacecraft Communications, Command and Tracking* and *32 Communications.*

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE 901

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics.*

06 AIRCRAFT INSTRUMENTATION 904

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography.*

07 AIRCRAFT PROPULSION AND POWER 904

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

08 AIRCRAFT STABILITY AND CONTROL 909

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

09 RESEARCH AND SUPPORT FACILITIES (AIR) 909

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

For related information see also *14 Ground Support Systems and Facilities (Space).*

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) 911

For extraterrestrial exploration see *91 Lunar and Planetary Exploration.*

13 ASTRODYNAMICS 911

Includes powered and free-flight trajectories; and orbit and launching dynamics.

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) 912

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.

For related information see also *09 Research and Support Facilities (Air).*

15 LAUNCH VEHICLES AND SPACE VEHICLES 912

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

16 SPACE TRANSPORTATION 913

Includes passenger and cargo space transportation, e.g., shuttle operations; and rescue techniques.

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation.*

17 SPACECRAFT COMMUNICATION, COMMAND AND TRACKING 913

Includes telemetry; space communications networks; astronavigation; and radio blackout.

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications.*

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE 914

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support.* For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics.*

19 SPACECRAFT INSTRUMENTATION 916

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography.*

20 SPACECRAFT PROPULSION AND POWER 916

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

For related information see also *07 Aircraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels.

23 CHEMISTRY AND MATERIALS (GENERAL) 919
Includes biochemistry and organic chemistry.

24 COMPOSITE MATERIALS 919
Includes laminates.

25 INORGANIC AND PHYSICAL CHEMISTRY 921
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.
For related information see also *77 Thermodynamics and Statistical Physics.*

26 METALLIC MATERIALS 924
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS 929
Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

28 PROPELLANTS AND FUELS 934
Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.
For related information see also *Physics.*

31 ENGINEERING (GENERAL) 935
Includes vacuum technology; control engineering; display engineering; and cryogenics.

32 COMMUNICATIONS 937
Includes land and global communications; communications theory; and optical communications.
For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

33 ELECTRONICS AND ELECTRICAL ENGINEERING 944
Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.
For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics.*

34 FLUID MECHANICS AND HEAT TRANSFER 956
Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.
For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

35 INSTRUMENTATION AND PHOTOGRAPHY 961
Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.
For aerial photography see *43 Earth Resources.* For related information see also *06 Aircraft Instrumentation* and *19 Spacecraft Instrumentation.*

36 LASERS AND MASERS 969
Includes parametric amplifiers.

37 MECHANICAL ENGINEERING 972
Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY 975
Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS 976
Includes structural element design and weight analysis; fatigue; and thermal stress.
For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance.*

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.
For related information see also *Space Sciences.*

42 GEOSCIENCES (GENERAL) 980

43 EARTH RESOURCES 982
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.
For instrumentation see *35 Instrumentation and Photography.*

44 ENERGY PRODUCTION AND CONVERSION 991
Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

45 ENVIRONMENT POLLUTION 995
Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS 995
Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.
For space radiation see *93 Space Radiation.*

47 METEOROLOGY AND CLIMATOLOGY 999
Includes weather forecasting and modification.

48 OCEANOGRAPHY 1009
Includes biological, dynamic and physical oceanography; and marine resources.

LIFE SCIENCES

Includes sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

51 LIFE SCIENCES (GENERAL) **1010**
Includes genetics.

52 AEROSPACE MEDICINE **1014**
Includes physiological factors; biological effects of radiation; and weightlessness.

53 BEHAVIORAL SCIENCES **1018**
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT **1019**
Includes human engineering; biotechnology; and space suits and protective clothing.

55 PLANETARY BIOLOGY **N.A.**
Includes exobiology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) **1021**

60 COMPUTER OPERATIONS AND HARDWARE **1022**
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering.*

61 COMPUTER PROGRAMMING AND SOFTWARE **1023**
Includes computer programs, routines, and algorithms.

62 COMPUTER SYSTEMS **1027**
Includes computer networks.

63 CYBERNETICS **1028**
Includes feedback and control theory.
For related information see also *54 Man/System Technology and Life Support.*

64 NUMERICAL ANALYSIS **1028**
Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY **1035**
Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS **N.A.**
Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS **1037**
Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

70 PHYSICS (GENERAL) **1037**
For geophysics see *46 Geophysics.* For astrophysics see *90 Astrophysics.* For solar physics see *92 Solar Physics.*

71 ACOUSTICS **1037**
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution.*

72 ATOMIC AND MOLECULAR PHYSICS **1040**
Includes atomic structure and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS **1041**
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation.*

74 OPTICS **1042**
Includes light phenomena.

75 PLASMA PHYSICS **1045**
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics.* For space plasmas see *90 Astrophysics.*

76 SOLID-STATE PHYSICS **1046**
Includes superconductivity.
For related information see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

77 THERMODYNAMICS AND STATISTICAL PHYSICS **1049**
Includes quantum mechanics; and Bose and Fermi statistics.
For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) **1050**
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT **1050**
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE 1054
Includes information storage and retrieval technology; micrography; and library science.
For computer documentation see *61 Computer Programming and Software.*

83 ECONOMICS AND COST ANALYSIS N.A.
Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE 1055
Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION 1055
Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.
For related information see also *Geosciences.*

88 SPACE SCIENCES (GENERAL) 1058

89 ASTRONOMY 1059
Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS 1060
Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION N.A.
Includes planetology; and manned and unmanned flights.
For spacecraft design see *18 Spacecraft Design, Testing and Performance.* For space stations see *15 Launch Vehicles and Space Vehicles.*

92 SOLAR PHYSICS 1060
Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION 1061
Includes cosmic radiation; and inner and outer earth's radiation belts.
For biological effects of radiation see *52 Aerospace Medicine.* For theory see *73 Nuclear and High-Energy Physics.*

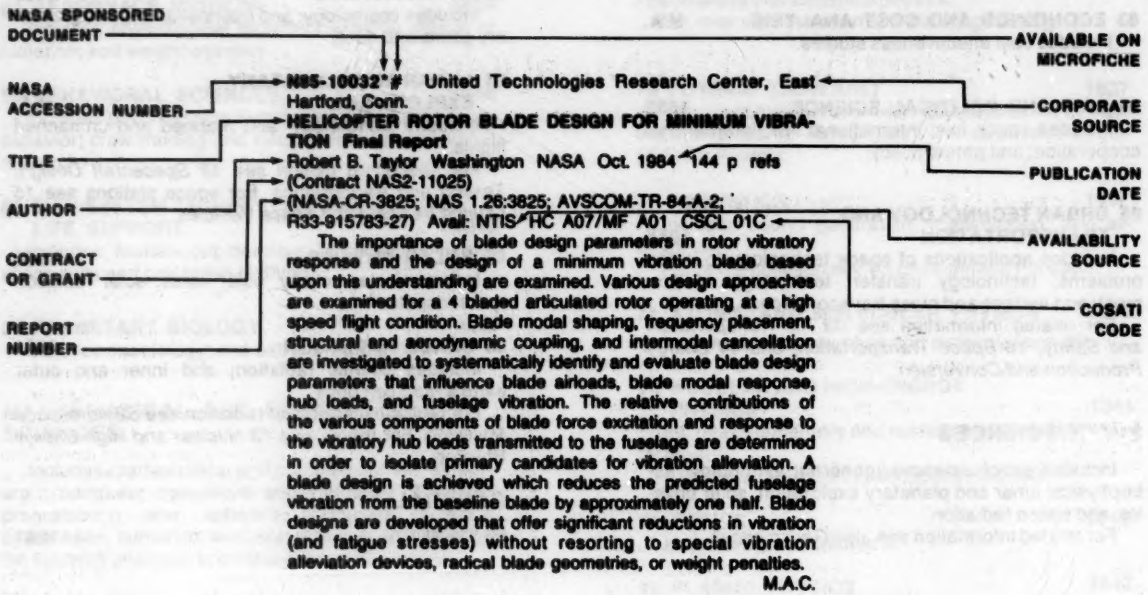
GENERAL

99 GENERAL 1061

Note: N.A. means that no abstracts were assigned to this category for this issue.

SUBJECT INDEX I-1
PERSONAL AUTHOR INDEX I-61
CORPORATE SOURCE INDEX I-69
CONTRACT NUMBER INDEX I-83
REPORT/ACCESSION NUMBER INDEX I-87

TYPICAL CITATION AND ABSTRACT


NASA SPONSORED DOCUMENT
AVAILABLE ON MICROFICHE
NASA ACCESSION NUMBER
N85-10032*# United Technologies Research Center, East Hartford, Conn.
CORPORATE SOURCE
TITLE
HELICOPTER ROTOR BLADE DESIGN FOR MINIMUM VIBRATION Final Report
AUTHOR
Robert B. Taylor Washington NASA Oct. 1984 144 p refs
PUBLICATION DATE
CONTRACT OR GRANT
(Contract NAS2-11025)
REPORT NUMBER
(NASA-CR-3825; NAS 1.26:3825; AVSCOM-TR-84-A-2; R33-915783-27) Avail: NTIS HC A07/MF A01 CSCL 01C
AVAILABILITY SOURCE
COSATI CODE
The importance of blade design parameters in rotor vibratory response and the design of a minimum vibration blade based upon this understanding are examined. Various design approaches are examined for a 4 bladed articulated rotor operating at a high speed flight condition. Blade modal shaping, frequency placement, structural and aerodynamic coupling, and intermodal cancellation are investigated to systematically identify and evaluate blade design parameters that influence blade airloads, blade modal response, hub loads, and fuselage vibration. The relative contributions of the various components of blade force excitation and response to the vibratory hub loads transmitted to the fuselage are determined in order to isolate primary candidates for vibration alleviation. A blade design is achieved which reduces the predicted fuselage vibration from the baseline blade by approximately one half. Blade designs are developed that offer significant reductions in vibration (and fatigue stresses) without resorting to special vibration alleviation devices, radical blade geometries, or weight penalties.
M.A.C.

VOLUME 23 NUMBER 7 / APRIL 8, 1985

Scientific and Technical Aerospace Reports

A Semimonthly Publication of the National Aeronautics and Space Administration

01 AERONAUTICS (GENERAL)

N85-15657*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF BODY SHAPE ON THE AERODYNAMICS OF A BODY OF REVOLUTION AT MACH NUMBERS FROM 1.6 TO 4.6
M. Leroy Spearman Jan. 1985 23 p refs Presented at the Am. Defense Preparedness Assoc. 8th Intern. Symp. on Ballistics, Orlando, Fla., Oct. 1984
(NASA-TM-86345; NAS 1.15:86345) Avail: NTIS HC A02/MF A01 CSCL 01B

The aerodynamic characteristics for several bodies of revolution have been determined from wind tunnel tests at Mach numbers from 1.6 to 4.63. Six bodies, each having a length-to-diameter ratio of 6.67, were investigated. Geometric modifications included forebody shape, afterbody shape, and midsection slope. Significant aerodynamic changes were observed to be functions of geometric change and Mach number. Because of the aerodynamic dependence on geometry as well as Mach number, it is obvious that a number of trades must be considered in selecting a projectile shape. Author

N85-15658*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEMPERATURE DISTORTION GENERATOR FOR TURBOSHAFT ENGINE TESTING
Gary A. Klann, Richard L. Barth, and Thomas J. Biesiadny Dec. 1984 34 p refs Presented at the SAE Aerospace Congr. and Exposition, Long Beach, Calif., 15-18 Oct. 1984
(NASA-TM-83748; USAAVSCOM-TR-84-C-12; E-2197; NAS 1.15:83748) Avail: NTIS HC A03/MF A01 CSCL 01B

The procedures and unique hardware used to conduct an experimental investigation into the response of a small-turboshaft-engine compression system to various hot gas ingestion patterns are presented. The temperature distortion generator described herein uses gaseous hydrogen to create both steady-state and time-variant, or transient, temperature distortion at the engine inlet. The range of transient temperature ramps produced by the distortion generator during the engine tests was from less than 111 deg K/sec (200 deg R/sec) to above 611 deg K/sec (1100 deg R/sec); instantaneous temperatures to 422 deg K (760 deg R) above ambient were generated. The distortion generator was used to document the maximum inlet temperatures and temperature rise rates that the compression system could tolerate before the onset of stall for various circumferential distortions as well as the compressor system response during stall. Author

N85-15659# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
UNITED STATES AIR FORCE AIRCRAFT MODIFICATION PROCESS: A SYSTEM DYNAMICS ANALYSIS M.S. Thesis
R. Bailey and H. F. Stalcup Sep. 1984 232 p
(AD-A146954; AFIT/GSM/LSY/84S-2) Avail: NTIS HC A11/MF A01 CSCL 01/3

A conceptual model of the Air Force aircraft modification process was developed and validated in this thesis. The model was designed using the system dynamics technology and is a tool to extend the knowledge and understanding of the decision and policy-makers within the modification process. Sources of information used in the development of the model included both literature research and personal interviews. The personal interviews were conducted with Air Force, DOD, OMB, and Congressional people active in the aircraft modification process. Five key issues concerning the behavior of the system were identified and detailed. These issues were: the lack of a systems approach to modification management, the absence of a Class IV requirements approval process, the difficulties of management split between AFSC and AFLC, the priority ranking of modifications by the financial community, and the weaknesses of the process which are currently overcome by strong individuals. Five recommendations for change to the modification process were presented. The recommendations were to establish a requirements review, approval, and ranking process for Class IV modifications, encourage a systems approach to management, improve the credibility and understanding of the process, and encourage competition by several means. GRA

N85-15660# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
PERFORMANCE EVALUATION OF A-10 AIRCRAFT MAINTENANCE UNITS AND AIRCRAFT USING CONSTRAINED FACET ANALYSIS M.S. Thesis
V. J. Gonnerman Sep. 1984 75 p
(AD-A146955; AFIT/GLM/LSM/84S-26) Avail: NTIS HC A04/MF A01 CSCL 15/5

Performance evaluation is required to obtained important feedback on system efficiency for management decision making. For Air Force aircraft maintenance managers, performance evaluation is crucial for determining capability and evaluating unit efficiency and effectiveness. This thesis effort applied Constrained Facet Analysis (CFA), a linear fractional programming technique, to the performance evaluation of aircraft maintenance units (AMUs) and aircraft. Empirical data for three AMUs covering a five month period of time and simulated data for 28 aircraft was evaluated using the CFA and Data Envelopment Analysis (DEA) computer programs at the University of Texas. Results show that CFA and DEA can be used to evaluate relative efficiency of Air Force units. GRA

N85-15661# Naval Ship Research and Development Center, Bethesda, Md.
CIRCULATION CONTROL: A BIBLIOGRAPHY OF DTNSRDC RESEARCH AND SELECTED OUTSIDE REFERENCES: UPDATE Research and Development Report, Jan. 1969 - Dec. 1983
R. J. Englar and C. A. Applegate Sep. 1984 55 p
(AD-A146966; AERO-1291; DTNSRDC-84/052) Avail: NTIS HC A04/MF A01 CSCL 05/2

This report is an update of a previously published bibliography (Report 77-0076) of formal reports, departmental reports, and

technical papers by personnel of the Aviation and Surface Effects Dept., David W. Taylor Naval Ship Research and Development Center. Included are publications for the period of January 1969 through December 1983. The citations are arranged chronologically and represent the development of circulation control technology at the Center over the past several years. Selected outside references pertinent to circulation control are presented in the appendix. Originator - supplied keywords include: Circulation control aerodynamics, Blown flaps, Boundary layer control, Bluff airfoils, Critical Mach number, Elliptic airfoils, Finite wing, Helicopter Rotor, Helicopter Rotor Airfoil, High Advance Ratios, High-Lift Systems, Hover Performance, Jet Flaps, Subsonic Wind Tunnel, STOL Aircraft, Tangential Blowing, and V/STOL Aircraft. GRA

N85-15662# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

PARAMETRIC ESTIMATES OF PROPULSION SYSTEM MAINTENANCE MANHOURS M.S. Thesis

T. J. Sharp Sep. 1984 97 p

(AD-A147120; AFIT/GLM/LSM/84S-57) Avail: NTIS HC A05/MF A01 CSCL 01/3

This thesis investigated the potential of using cost-estimating relationships (CERs) to estimate aircraft maintenance manhour requirements for propulsion systems. The performance specifications and physical parameters of a large sample of USAF turbine engines were used to develop CERs. These CERs could be applied early in the life cycle of an engine in acquisition in order to estimate future maintenance requirements and effect design configuration changes. The analysis was accomplished by the method of linear regression analysis of least squares. The CERs resulting from the regression were subjected to three tests to determine their predictive capability. A number of the CERs developed in the study displayed sufficient accuracy to be considered for application on acquisition programs. GRA

N85-15663# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A Q-GERT NETWORK SIMULATION MODEL FOR EXAMINING PIPELINE TIME IN THE NAVY'S J-52 INTERMEDIATE LEVEL JET ENGINE REPAIR CYCLE M.S. Thesis

M. N. Romero Sep. 1984 152 p

(AD-A147269; AFIT/GLM/LSM/84S-56) Avail: NTIS HC A08/MF A01 CSCL 15/5

Recent data suggest that the actual turnaround time (TAT) for the J-52 engine is almost four times the standard specified by the directive. One approach to investigating this excessive time in the pipeline is to examine the operation of the repair system, focussing attention on the utilization of resources. The objective of this project was, therefore, to develop a computer simulation model which replicates the J-52 intermediate level repair cycle, concentrating on repair crews, workstands, and test cells as the major resources employed. A hypothetical scenario based on contrived parameters was developed in order to convert the model to code and demonstrate its application on the computer. The results of a sample simulation show that excessive rapair backlogs and delays as well as inefficient resource utilization can, in fact, be identified in the output, thereby paving the way for management to experiment with different resource utilization schemes in order to achieve a lower TAT. GRA

N85-15664# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

OPERATIONAL LOADS DATA

Loughton, England Aug. 1984 303 p refs In ENGLISH and FRENCH Conf. held in Sienna, Italy, 2-6 Apr. 1984

(AGARD-CP-375; ISBN-92-835-0363-5) Avail: NTIS HC A14/MF A01

General principles followed in acquiring data on operational loads sustained by NATO aircraft, both fixed and rotary wing, in normal service were examined. Current and developing loads data acquisition programs were compared. The techniques used and data obtained from work on a variety of aircraft types were reported; microprocessor-based systems were seen as providing the essential technology for major advances in this field. Although the main emphasis was on fatigue loads, the acquisition of design loads data was also discussed, together with the validity of current data bases for loads calculations on high-agility designs representative of the next generation of combat aircraft. For individual titles, see N85-15665 through N85-15683.

N85-15665# Ministry of Defence, London (England). Materials and Structures Dept.

OPERATIONAL LOADS MEASUREMENT: A PHILOSOPHY AND ITS IMPLEMENTATION **c05**

Dorothy M. Holford and J. R. Sturgeon *In* AGARD Operational Loads Data Aug. 1984 22 p refs (For primary document see N85-15664 07-01)

Copyright. Avail: NTIS HC A14/MF A01

A philosophy of operational data acquisition, for structural objectives, within the general field of in-flight load measurement is reviewed, highlighting the constraints such activities place on the data acquisition system. One such system which can be tailored to perform a variety of tasks ranging from the collection of time histories of flight parameters or strain gauges to complex fatigue load analyses throughout the airframe is described. The system comprises a digital cassette recorder and a data acquisition unit within which a microprocessor is used for control of data acquisition and in-flight data analysis. System requirements in terms of accuracy, bandwidth and sampling rates are discussed for a range of aircraft types and operating conditions. The various modes of operation of the system are illustrated by examples drawn from operational experience with the system. These demonstrate the capability of the system to produce data suitable for automatic analysis in a variety of operational environments in both fixed and rotary wing aircraft. The examples clearly show the value of studying operational data in terms of fatigue life management, fatigue life monitoring, operational practices and design procedures. B.W.

N85-15666# McDonnell Aircraft Co., St. Louis, Mo. Structural Dynamics and Loads Dept.

THE F-15 FLIGHT LOADS TRACKING PROGRAM **c05**

J. T. Johnston, R. E. Pinckert, and R. A. Melliere *In* AGARD Operational Loads Data Aug. 1984 7 p ref (For primary document see N85-15664 07-01)

Copyright. Avail: NTIS HC A14/MF A01

The F-15 flight loads tracking program is described. The tracking program consists of four phases: (1) data collection; (2) data reduction; (3) fatigue damage analysis; and (4) fleet management. Data collection is accomplished with a multi-channel recorder and a load factor (g) exceedance counter. Twenty percent of the fleet is equipped with the multi-channel recorder and every F-15 has a g exceedance counter installed. After the fleet data have been reduced by the Air Force it is sent to McDonnell Aircraft for conducting fatigue damage analyses. Quarterly Service Aircraft Fatigue Estimate (SAFE) reports inform the Air Force how much fatigue life has been expended on each aircraft. These reports are used for establishing inspections and aid in fleet management of the F-15 Eagles. This mature program, approaching, 1,000,000 flight hours, has been valuaable for solving in-service structural problems, understanding why the problems occurred, developing repairs, and for redesign. Future aircraft design will also benefit from this information. B.W.

N85-15667# National Aerospace Lab., Amsterdam (Netherlands).

STRUCTURAL LOAD MEASUREMENTS ON A NORTHROP NF-5A **c05**

D. J. Spiekhout *In* AGARD Operational Loads Data Aug. 1984 15 p (For primary document see N85-15664 07-01)

Copyright. Avail: NTIS HC A14/MF A01

Load measurements were carried out on an NF-5A aircraft instrumented with a large number of strain gage bridges in the wing and the tail surfaces. Measurements included: (1) Specific stationary maneuvers; (2) Specific dynamic maneuver conditions; and (3) Complete mission segments typical for RNLAF-operational conditions. Using ground calibration results, recorded strains were converted to sectional loads and with flight parameters like V, H,

acc. etc., stored in a structural load data base (15 flights covering 7 configurations and 713 measuring runs). By means of an interactive computer program the data stored in this data base are easily accessible. The results can be presented in tables or in graphical form. The Data Base may be used to evaluate the effect of changes in operational procedures, stores and store configurations on the fatigue load experience in various structural areas. A general description is given of the instrumentation used, the data handling and the flight conditions that were recorded. The possible use of the data base is illustrated by means of a number of examples. B.W.

N85-15668# Naval Air Development Center, Warminster, Pa. Airframe Engineering Branch.
NAVY OPERATIONAL LOADS DATA SOURCES AND SYSTEMS c05
A. H. Johnson and M. J. Dubberly (Naval Air Systems Command) *In* AGARD Operational Loads Data Aug. 1984 20 p (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

An overview of the Navy's total Aircraft Structural Life Surveillance Program is presented. Current Fatigue Monitoring Program operational achievements and costs are described. The loads data acquisition systems for the F-14, F-18, A-7, and A-3 aircraft are also described. Future expectations regarding operational features, results, and costs are discussed. Operational loads data from the Tactical Air Combat Training System for air combat training, and the 70 mm film system for landing loads, are also described. B.W.

N85-15669# Industrieanlagen-Betriebsgesellschaft m.b.H., Ottobrunn (West Germany).
OPERATIONAL LOADS DATA EVALUATION FOR INDIVIDUAL AIRCRAFT FATIGUE MONITORING c05
Richard Schuetz and Rolf Neunaber *In* AGARD Operational Loads Data Aug. 1984 23 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

The utility of individual aircraft tracking (IAT) as an effective instrument for introducing the necessary maintenance activities which need to be adapted individually to each aircraft is examined. One of the most important activities within the IAT scope is the processing of operational loads data in order to calculate to consumed fatigue life of individual aircraft. The installed operational service load recording systems for military aircraft within the German Air Force include logforms, counting accelerometers and digital flight recorders. Under consideration are sytems for direct measurement of loads and damage. The main activities of individual aircraft tracking include: (1) loads and component data acquisition; (2) damage calculation; (3) calculation of allowable fatigue life; (4) prediction of maintenance actions; (5) derivation of standard load sequences or spectra; (6) cost effectiveness consideration; (7) verification of fatigue load monitoring; and (8) selection of load monitoring systems. B.W.

N85-15670# Messerschmitt-Boelkow-Blohm G.m.b.H., Toulouse (France). Airbus Program.
STRUCTURAL FLIGHT LOAD MEASUREMENT DEMONSTRATION OF STRUCTURAL INTEGRITY c05
E. Rauscher *In* AGARD Operational Loads Data Aug. 1984 9 p (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

Structural flight load testing is an important part of the certification of an aircraft. Calibration of strain gauges and bridge selection and evaluation of flight parameters for fatigue and static test problems are described. Procedures presented as an example here were used for flight testing on different types as fighters and military and civilian transport aircrafts. There are several evaluation methods for short and long flight periods to check design loads for static and fatigue criteria. The Maximum Likelihood method is used to investigate aerodynamic coefficients. Counting procedures are used for statistical purposes. B.W.

N85-15671# British Aerospace Aircraft Group, Stockport (England). Structures Dept.
ADVANCED FATIGUE MONITORING ON SERVICE AIRCRAFT c39
A. Walkden *In* AGARD Operational Loads Data Aug. 1984 16 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

An exercise on a Royal Air Force aircraft where typical service data was collected to: (1) define the loading actions which should be included in a full scale wing fatigue test; (2) enable theoretical fatigue lives for wing, tailplane, fin and undercarriage to be calculated; and (3) define which parameters might be measured in a comprehensive fit of advanced fatigue meters so that the life of the main structural components of each aircraft could be accurately measured is described. R.J.F.

N85-15672# British Aerospace Aircraft Group, Preston (England).
EXPERIENCES OBTAINED FROM SERVICE FATIGUE MONITORING EXERCISES c39
A. P. Ward *In* AGARD Operational Loads Data Aug. 1984 16 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

Two recent empennage fatigue load monitoring exercises involving the Jaguar and the Jet Provost aircraft are described. In each case digital recording technique were used and rainflow analysis techniques were employed to determine fatigue loading matrices. Problems were encountered in analysing the recorded data and these are enumerated. The more recent assessment of the Jet Provost provided a high rate of data recovery and benefited from experiences gained from the Jaguar exercise. The conventional method of assessing fin load spectra was found not to provide an adequate safeguard for the later Marks of Jet Provost where significant changes in operating patterns and speeds could not be taken into account adequately by theoretical methods. R.J.F.

N85-15673# Canadair Ltd., Montreal (Quebec). Military Support, Technical Dept.
CF-5 VERTICAL STABILIZER FLIGHT LOAD SURVEY c05
N. Nguyen Trong *In* AGARD Operational Loads Data Aug. 1984 12 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

In order to arrive at a reliable life prediction for the CF-5 vertical stabilizer, a flight load survey was carried out to determine the load spectra. Specific missions were flown with an instrumented aircraft and the resulting load spectra were factored to represent the reported mission profiles for squadron aircraft. Subsequently, it was decided to monitor a percentage of the fleet during routine operation and derive more representative spectra. The results of the flight load survey and the load monitoring program were compared. The effect of the results on fatigue life prediction and damage tolerance analysis is discussed. It is concluded that a short flight test program gives valid results which are useful for immediate use, and that the fleet wide load monitoring program consolidates and verifies the findings. R.J.F.

N85-15674# General Dynamics Corp., Fort Worth, Tex. F-16 Loads and Criteria Dept.
F-16 FORCE MANAGEMENT, YESTERDAY, TODAY AND TOMORROW c05
R. L. Culp *In* AGARD Operational Loads Data Aug. 1984 15 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

United States Air Force regulations specify that a Force Management Program will be established for each aircraft system within its inventory. The approach taken by General Dynamics to fulfill the objectives of the Force Management Program for the F-16 aircraft is discussed. The methodology employed, the current status and the future plans for the F-16 Force Management Program in the areas of operational data acquisition, processing and airframe structural maintenance planning are discussed in detail. R.J.F.

N85-15675# Army Research and Technology Labs., Fort Eustis, Va. Applied Technology Lab.
US ARMY HELICOPTER OPERATIONAL FLIGHT LOADS c05
Donald J. Merkley and Harold K. Reddick, Jr. *In* AGARD Operational Loads Data Aug. 1984 26 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

The findings from the Army's helicopter service usage programs and the Operational Loads Survey program are discussed. The development and capability of the Structural Integrity Recording System is described. R.J.F.

N85-15676# Westland Aircraft Ltd., Yeovil (England).
HELICOPTER DATA ACQUISITION IN WHL c05
F. S. Grainger *In* AGARD Operational Loads Data Aug. 1984 17 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

An approach to loads monitoring designed to fulfil two requirements is discussed. The first requirement is the elimination, as far as possible, of costly parts being thrown away because of overly conservative assumptions with respect to usage. The second requirement is to assure the assumed safety standards by knowledge of the in-service aircraft utilization. Specific problems appropriate to the helicopter make this task more difficult, but nevertheless the fundamental steps were taken to commence data acquisition. The nature of the task requires considerable aircraft management to ensure that as many role configurations are covered as possible. Since the data is acquired in real time, the acquisition of a statistically significant amount will be spread over the next few years. Nevertheless, early signs indicate that a considerable number of improvements will be accrued from even early data received. This approach also provides the ability to encompass new roles for an in-service aircraft type, in a much more rigorous way than current estimating methods. The methodology should also provide an information database against which to test loading theories (such as random load) and extend statistical scatter knowledge on times. R.J.F.

N85-15677# Messerschmitt-Boelkow-Blohm G.m.b.H., Bremen (West Germany). Load Criteria Section.
EVALUATION OF OPERATIONAL LOADS TO VERIFY STRUCTURAL DESIGN c05
H. Struck and H. Balke *In* AGARD Operational Loads Data Aug. 1984 16 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

A load evaluation method derived from operational maneuvers and the design requirements applied were presented. The method is based on the hypothesis that all maneuvers trained and flown by the Air Force can be standardized. Relevant parameters that are suitable to describe the maneuver time history with respect to load analysis were chosen. The standardization of maneuver parameters is demonstrated for two fighter aircraft and a few maneuver types. The correlated parameters necessary to derive structural loads, including control surface deflections can be determined, by standardized maneuvers. Operational loads on main structural components are evaluated by application of maneuver model. Extreme operational loads evaluated with the maneuver model and those determined by the design requirements are compared. E.A.K.

N85-15678# Canadair Ltd., Montreal (Quebec).
TUTOR (CL-41A) TAIL FLIGHT LOAD SURVEY c05
A. Paquin and J. Skotnicki (National Defence Headquarters) *In* AGARD Operational Loads Data Aug. 1984 15 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

An inflight structural failure of the Canadair Tutor aircraft horizontal tail fitting resulted in a flight load survey. An instrumented test aircraft was flown to the extremes of its structural envelope, and strains were recorded at 43 different locations on the rear fuselage and the empennage of the aircraft. The test instrumentation, the calibration performed on the test article, and the resulting formulation of load equations for estimating shear, bending moment and torque at various locations on the rear fuselage, the vertical and the horizontal stabilizer are described. The various missions and maneuvers flown to gather the necessary data and the data acquisition, verification and reduction methods are discussed. E.A.K.

N85-15679# Avions Marcel Dassault, Saint-Cloud (France).
AEROELASTIC ANALYSIS AND THE IDENTIFICATION OF FLIGHT LOADS [ANALYSE AEROELASTIQUE ET IDENTIFICATION DES CHARGES EN VOL] c05
C Petiau and M. deLavigne *In* AGARD Operational Loads Data Aug. 1984 22 p refs In FRENCH (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

A coupling procedure was developed for static analysis and load calculation in which pressure loads, obtained using aerodynamic theory, are transferred directly onto the finite element model. This sophisticated method singularly complicates the problem of smoothing models of the results of wind tunnel or flight tests. Processes of identification were studied with a view to easily reflecting the results of flight tests in complex aeroelastic models and to review, as rapidly as possible, the calculations justifying the structure and the static loads from ground tests.
Transl. by A.R.H.

N85-15680# British Aerospace Aircraft Group, Preston (England).
TORNADO: STRUCTURAL USAGE MONITORING SYSTEM (SUMS) c39
A. P. Ward *In* AGARD Operational Loads Data Aug. 1984 13 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

The background for the establishment of the tornado structural usage monitoring system (SUMS) is reviewed. The possible monitoring methods and the decision to opt for two approaches using flight parameters and load calibrated strain gauges are amplified. The calibration and instrumentation requirements are described and the use of SUMS data is discussed. E.A.K.

N85-15681# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
KEEPING UP WITH OPERATIONAL LOADS IN THE FRENCH AIR FORCE: DEFINING NEW EQUIPMENT [SUIVI DES CHARGES EN SERVICE DANS L'ARMEE DE L'AIR FRANCAISE DEFINITION D'UN NOUVEAU MATERIEL] c39
L. Baranes and J. P. Cornand *In its* Operational Loads Data Aug. 1984 12 p In FRENCH (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

To remedy the lacunae of present statistical accelerometers for following the operational loads of French Air Force aircraft a system was developed which offers the possibility of acquiring multiple parameters in association with a better data reduction logic. Topics covered include: (1) following real loads with emphasis on problems posed by using simple accelerocomputers; (2) defining the characteristics of the system developed and experience using the prototype; (3) a description of the series version of the prototype system for studying structural damage (SPEES); and (4) applications envisioned and future development considered for SPEES. Transl. by A.R.H.

N85-15682# Aeritalia S.p.A., Torino (Italy). Gruppo Velivoli da Combattimento.
FLIGHT PARAMETERS RECORDING FOR STRUCTURE FATIGUE LIFE MONITORING c35
F. Staropoli *In* AGARD Operational Loads Data Aug. 1984 7 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

The Tornado flight parameter recording system and its role in structure fatigue life monitoring are described. The system performs both on-board and on-ground recording and analysis functions. The fatigue analysis block program, data filtering subroutine, and

damage calculation subroutine are described. The benefits of the system to fleet life management and safety are discussed. E.A.K.

N85-15683# Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Force Management Group.
USAF APPROACH TO AIRBORNE STRUCTURAL DATA RECORDING: AIRBORNE DATA ACQUISITION MULTIFUNCTION SYSTEM (ADAMS) c35
Ray J. Veldman *In* AGARD Operational Loads Data Aug. 1984 3 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

Current approaches to structural recording and considerations of future instrumentation systems are presented. The current state of the art of microprocessor technology lends itself to the development of airborne recording systems capable of onboard processing and data compression with solid state data storage. Such systems reduce supportability requirements because of increased reliability inherent to solid state electronics while providing processing and self diagnostic capability which were heretofore unachievable. These microprocessor based systems which record structural operational information are designated within the Air Force as the (ADAMS) airborne data acquisition multifunction system. E.A.K.

02 AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer.*

N85-15684*# National Aeronautics and Space Administration, Washington, D. C.
UNSTEADY FLOW CHARACTERISTICS IN THE NEAR-WAKE OF A TWO-DIMENSIONAL OBSTACLE
A. Dyment and P. Gryson Nov. 1984 28 p refs Transl. into ENGLISH of "Quelques Proprietes de l'Ecoulement Instationnaire dans le Sillage Proche d'un Obstacle Bidimensional" Rept. AAAF-NT-79-08 Association Aeronautique et Astronautique de France, 1979 p 1-21 Original language document was announced as N80-13008 Transl. by The Corporate Word, Inc., Pittsburgh, Pa.
(Contract NASw-4006)
(NASA-TM-77762; NAS 1.15:77762; AAAF-NT-79-08) Avail: NTIS HC A03/MF A01 CSCL 10A

The influence of the characteristics of the boundary layer separation on the formation of vortices and alternate paths in the wake of a bidimensional obstacle at high Reynolds numbers was studied by ultra fast visualization system. It is shown that there are alternate paths for laminar and turbulent flows, with similar flow characteristics. It is found that emission of vortices does not change substantially when the flow passes from laminar to turbulent. A film with a time scale change of 10,000 times illustrates some of the discussed phenomena. Author (ESA)

N85-15685*# Grumman Aerospace Corp., Bethpage, N.Y. Fluid Mechanics Directorate.
SUPERSONIC NONLINEAR POTENTIAL ANALYSIS Interim Final Report
M. J. Siclari Aug. 1984 78 p refs
(Contract NAS1-16758)
(NASA-CR-172456; NAS 1.26:172456; RE-690) Avail: NTIS HC A05/MF A01 CSCL 01A

The NCOREL computer code was established to compute supersonic flow fields of wings and bodies. The method encompasses an implicit finite difference transonic relaxation method to solve the full potential equation in a spherical coordinate system. Two basic topic to broaden the applicability and usefulness of the present method which is encompassed within the computer code NCOREL for the treatment of supersonic flow problems were studied. The first topic is that of computing efficiency. Accelerated schemes are in use for transonic flow problems. One such scheme is the approximate factorization (AF) method and an AF scheme to the supersonic flow problem is developed. The second topic is the computation of wake flows. The proper modeling of wake flows is important for multicomponent configurations such as wing-body and multiple lifting surfaces where the wake of one lifting surface has a pronounced effect on a downstream body or other lifting surfaces. E.A.K.

N85-15686*# Complere, Inc., Palo Alto, Calif.
A SCANNING LASER VELOCIMETER FOR TURBULENCE RESEARCH
F. K. Duen Sep. 1984 29 p refs
(Contract NAS1-17572)
(NASA-CR-172493; NAS 1.26:172493) Avail: NTIS HC A03/MF A01 CSCL 01A

Turbulent and unsteady separated flows occur on most practical flight vehicles, but are not yet sufficiently understood for designs to provide safe margins of performance without recourse to extensive experiment and computation. In date, reliable experimental data for even basic flows is severely limited and does not yet provide a satisfactory data base with which to assess current design and calculation methods. Although the laser velocimeter (LV) has become a proven, nonintrusive instrument for the measurement of local mean velocities and turbulence properties, measurements have been of a mean, statistical nature derived from averages accumulated independently at different positions in the flow. Thus, the measurements do not give an instantaneous dynamic, picture of the flow-field structures. Accordingly, a new technique for rapid LV scans of turbulent flow fields was proposed. The potential of this new instrument for fundamental fluid mechanical measurements of turbulent flows has been demonstrated. The results clearly show that significant unsteady flow features are hidden by conventional measurements and that the scanning laser velocimeter should prove an invauable tool in future studies of the structure of turbulent flows. B.W.

N85-15687*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
GROUND-EFFECT ANALYSIS OF A JET TRANSPORT AIRPLANE
Robert E. Curry and Albion H. Bowers Jan. 1984 12 p refs Presented at the 23rd AIAA Aerospace Sci. Meeting, Reno, Nev., 14-17 Jan. 1985
(NASA-TM-85920; H-1273; NAS 1.15:85920; AIAA-85-0307) Avail: NTIS HC A02/MF A01 CSCL 01A

An analysis of the ground effect of a jet transport airplane has been made. Data were obtained from recent flight tests primarily using the constant angle-of-attack approach technique. Reasonable results were obtained for ground-effect pitching moment and lift increments. These were compared with data from other sources, including computations, wind tunnel, and previous flight test. A recommended ground-effect model was developed from the results. A brief simulator study was conducted to determine the sensitivity of a particular configuration to this ground-effect model and its associated uncertainty. Author

N85-15688*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYTICAL MODELING OF CIRCUIT AERODYNAMICS IN THE NEW NASA LEWIS WIND TUNNEL
Charles E. Towne, Louis A. Povinelli, William G. Kunik, Kenneth K. Muramoto, Christopher E. Hughes, and Ralph Levy (Scientific Research Associates) 1985 22 p refs Presented at the 23rd Aerospace Sci. Meeting, Reno, Nev., 14-17 Jan. 1985; sponsored by AIAA
(NASA-TM-86912; E-2405; NAS 1.15:86912; AIAA-85-0380) Avail: NTIS HC A02/MF A01 CSCL 01A

Rehabilitation and extention of the capability of the altitude wind tunnel (AWT) was analyzed. The analytical modeling program involves the use of advanced axisymmetric and three dimensional viscous analyses to compute the flow through the various AWT

components. Results for the analytical modeling of the high speed leg aerodynamics are presented; these include: an evaluation of the flow quality at the entrance to the test section, an investigation of the effects of test section bleed for different model blockages, and an examination of three dimensional effects in the diffuser due to reentry flow and due to the change in cross sectional shape of the exhaust scoop. E.A.K.

N85-15689*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
UNSTEADY PRESSURE MEASUREMENTS ON A BICONVEX AIRFOIL IN A TRANSONIC OSCILLATING CASCADE
Loretta M. Shaw, Donald R. Boldman, Alvin E. Buggele, and Daniel H. Buffum (Purdue Univ.) 1985 18 p refs Proposed for presentation at the 30th Intern. Gas Turbine Conf. and Exhibit, Houston, Tex., 17-21 Mar. 1985; sponsored by the American Society of Mechanical Engineering
(NASA-TM-86914; E-2408; NAS 1.15:86914) Avail: NTIS HC A02/MF A01 CSCL 01A

Flush-mounted dynamic pressure transducers were installed on the center airfoil of a transonic oscillating cascade to measure the unsteady aerodynamic response as nine airfroils were simultaneously driven to provide 1.2 deg of pitching motion about the midchord. Initial tests were performed at an incidence and angle of 0 deg and A Mach number of 0.65 in order to obtain results in a shock-free compressible flowfield. Subsequent tests were performed at an incidence angle of 7 deg and Mach number of 0.8 in order to observe the surface pressures with an oscillating shock near the leading edge of the airfoil. Results are presented for interblade phase angles of 90 and -90 deg and at blade oscillatory frequencies of 200 and 500 Hz (semi-chord reduced frequencies up to about 0.5 at a Mach number of 0.8). Results from the zero-incidence cascade are compared with a classical unsteady flat-plate analysis. Flow visualization results depicting the shock motion on the airfoils in the high-incidence cascade are discussed. The airfoil pressure data are tabulated. Author

N85-15690*# Kansas Univ., Lawrence. Flight Research Lab.
AN INVESTIGATION OF VORTEX-INDUCED AERODYNAMIC CHARACTERISTICS OF SUPERSONIC CRUISE CONFIGURATIONS Semiannual Status Report, 1 Jul. - 31 Dec. 1984
C. Edward Lan 28 Jan. 1985 14 p refs
(Grant NsG-1629)
(NASA-CR-174299; NAS 1.26:174299) Avail: NTIS HC A02/MF A01 CSCL 01A

The linear lifting surface theory which predicts the life in supersonic flow, even though the drag is usually underpredicted, is described. A method for calculating the nonlinear wave drag was developed to remedy this deficiency. The calculated sectional drag is modified by adding the difference between the exact two dimensional (2-D) and the linear 2-D wave drag at the calculated sectional lift coefficient. Improvement in the supersonic drag prediction is shown. The VORCAM code was modified for the FORTRAN 77 language and its input stream was rearranged. The Boeing code was adapted to the computer system. All CDC special features in the code are replaced with standard FORTRAN algorithms. It is suggested that because of the nonlinearity the solution appears to be nonunique crowding of two vortices, a mechanism of vortex asymmetry, is investigated. E.A.K.

N85-15691*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LOADS AND AEROELASTICITY DIVISION RESEARCH AND TECHNOLOGY ACCOMPLISHMENTS FOR FY 1984 AND PLANS FOR FY 1985
James E. Gardner and S. C. Dixon Jan. 1985 162 p refs
(NASA-TM-86356; NAS 1.15:86356) Avail: NTIS HC A08/MF A01 CSCL 01A

The loads and aeroelasticity divisions research accomplishments are presented. The work under each branch or technical area, described in terms of highlights of accomplishments during the past year and highlights of plans for the current year as they relate to 5 year plans for each technical area. This information will be useful in program coordination with other government organizations and industry in areas of mutual interest. E.A.K.

N85-15692*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
DESIGN STUDY OF TECHNOLOGY REQUIREMENTS FOR HIGH PERFORMANCE SINGLE-PROPELLER-DRIVEN BUSINESS AIRPLANES Final Report
David L. Kohlman and James Hammer Washington NASA Jan. 1985 105 p refs
(NASA-CR-3863; NAS 1.26:3863; KU-FRL-487-1) Avail: NTIS HC A06/MF A01 CSCL 01A

Developments in aerodyamic, structural and propulsion technologies which influence the potential for significant improvements in performance and fuel efficiency of general aviation business airplanes are discussed. The advancements include such technologies as natural laminar flow, composite materials, and advanced intermittent combustion engines. The design goal for this parameter design study is a range of 1300 nm at 300 knots true airspeed with a payload of 1200lbs at 35,000 ft cruise altitude. The individual and synergistic effects of various advanced technologies on the optimization of this class of high performance, single engine, propeller driven business airplanes are identified. EAK

N85-15693*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DOWNWASH IN THE PLANE OF SYMMETRY OF AN ELLIPTICALLY LOADED WING
James D. Phillips Jan. 1985 26 p refs
(NASA-TP-2414; A-9871; NAS 1.60:2414) Avail: NTIS HC A03/MF A01 CSCL 01A

A closed-form solution for the downwash in the plane of symmetry of an elliptically loaded line is given. This theoretical result is derived from Prandtl's lifting-line theory and assumes that: (1) a three-dimensional wing can be replaced by a straight lifting line, (2) this line is elliptically loaded, and (3) the trailing wake is a flat-sheet which does not roll up. The first assumption is reasonable for distances greater than about 1 chord from the wing aerodynamic center. The second assumption is satisfied by any combination of wing twist, spanwise camber variation, or planform that approximates elliptic loading. The third assumption is justified only for high-aspect-ratio wings at low lift coefficients and downstream distances less than about 1 span from the aerodynamic center. It is shown, however, that assuming the wake to be fully rolled up gives downwash values reasonably close to those of the flat-sheet solution derived in this paper. The wing can therefore be modeled as a single horseshoe vortex with the same lift and total circulation as the equivalent ellipticity loaded line, and the predicted downwash will be a close approximation independent of aspect ratio and lift coefficient. The flat-sheet equation and the fully rolled up wake equation are both one-line formulas that predict the upwash field in front of the wing, as well as the downwash field behind it. These formulas are useful for preliminary estimates of the complex aerodynamic interaction between two wings (i.e., canard, tandem wing, and conventional aircraft) including the effects of gap and stagger. Author

N85-15694*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A COMPARATIVE STUDY OF THE NONUNIQUENESS PROBLEM OF THE POTENTIAL EQUATION
M. D. Salas, A. Jameson (Princeton Univ., N.J.), and R. E. Melnik (Grumman Aerospace Corp., Bethpage, N.Y.) Jan. 1985 23 p refs
(NASA-TP-2385; L-15682; NAS 1.60:2385) Avail: NTIS HC A02/MF A01 CSCL 01A

The nonuniqueness problem occurring at transonic speeds with the conservative potential equation is investigated numerically. The study indicates that the problem is not an inviscid phenomenon, but results from approximate treatment of shock waves inherent in the conservative potential model. A new bound on the limit of validity of the conservative potential model is proposed. Author

N85-15695*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AILERON EFFECTIVENESS FOR A SUBSONIC TRANSPORT MODEL WITH A HIGH-ASPECT-RATIO SUPERCRITICAL WING
Peter F. Jacobs Dec. 1983 277 p refs
(NASA-TM-85674; L-15646; NAS 1.15:85674) Avail: NTIS HC A13/MF A01 CSCL 01A

Aileron effectiveness for a subsonc energy efficient transport (EET) model with a high aspect ratio supercritical wing was determined in the 8-foot transonic pressure tunnel. Data are presented for ailerons located at three positions along the wing span. The ailerons were designed as a preliminary active control concept with gust load alleviation, maneuver load alleviation, and flutter suppression systems. A linear variation of rolling moment coefficient with angle of attack for individual and multiple aileron deflections at Mach numbers up to 0.81 is indicated. For Mach numbers greater than 0.81, the rolling moment coefficient data become nonlinear with increasing angle of attack. At Mach numbers near the design value increased aileron effectiveness resulted from aft transition locations, which produced relatively thin boundary layers and greater effective aileron deflections. Individual aileron deflections on the right wing panel produced only small effects on yawing moment and side force coefficients. E.A.K.

N85-15696*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AN EXPLORATORY STUDY OF FINITE DIFFERENCE GRIDS FOR TRANSONIC UNSTEADY AERODYNAMICS
David A. Seidel, Robert M. Bennett, and Woodrow Whitlow, Jr. Dec. 1982 39 p refs Presented at the 21st AIAA Aerospace Sci. Meeting, Reno, Nev., 10-13 Jan. 1983
(NASA-TM-84583; NAS 1.15:84583; AIAA-83-0503) Avail: NTIS HC A03/MF A01 CSCL 01A

Unsteady aerodynamic forces are calculated by the XTRAN2L finite difference program which solves the complete two dimensional unsteady transonic small perturbation equation. The unsteady forces are obtained using a pulse transfer function technique which assumes the flow field behaves in a locally linear fashion about a mean condition. Forces are calculated for a linear flat plate using the default grids from the LTRAN2-NLR, LTRAN2-HI, and XTRAN3S programs. The forces are compared to the exact theoretical values for flat plate, and grid generated boundary and internal numerical reflections are observed to cause significant errors in the unsteady airloads. Grids are presented that alleviate the reflections while reducing computational time up to fifty-three percent and program size up to twenty-eight percent. Forces are presented for a six percent thick parabolic arc airfoil which demonstrate that the transform technique may be successfully applied to nonlinear transonic flows. Author

N85-15697*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMPARISON OF ANALYTICAL AND EXPERIMENTAL STEADY- AND UNSTEADY-PRESSURE DISTRIBUTIONS AT MACH NUMBER 0.78 FOR A HIGH-ASPECT-RATIO SUPERCRITICAL WING MODEL WITH OSCILLATING CONTROL SURFACES
William E. McCain Jan. 1984 56 p refs
(NASA-TM-84589; NAS 1.15:84589) Avail: NTIS HC A04/MF A01 CSCL 01A

The unsteady aerodynamic lifting surface theory, the Doublet Lattice method, with experimental steady and unsteady pressure measurements of a high aspect ratio supercritical wing model at a Mach number of 0.78 were compared. The steady pressure data comparisons were made for incremental changes in angle of attack and control surface deflection. The unsteady pressure data comparisons were made at set angle of attack positions with oscillating control surface deflections. Significant viscous and transonic effects in the experimental aerodynamics which cannot be predicted by the Doublet Lattice method are shown. This study should assist development of empirical correction methods that may be applied to improve Doublet Lattice calculations of lifting surface aerodynamics. E.A.K.

N85-15698# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
A METHOD FOR SOLVING THE INVERSE PROBLEM OF TRANSONIC CASCADE FLOW
C. Zengjing and Z. Zixiang 28 Sep. 1984 15 p Transl. into ENGLISH from Shuzhi Jisuan yu Jisuanji Yingyong (China), v. 4, no. 4, 1983 p 241-246
(AD-A146739; FTD-ID(RS)T-1118-84) Avail: NTIS HC A02/MF A01 CSCL 20/4

A method for solving the inverse problem of transonic cascade flow in a coordinate system is given. Given the upstream and downstream conditions and the velocity distribution on cascade, the flow field is obtained by solving the full potential equation with velocity as the unknown with the line relaxation method. Subsequently, the field is transformed back into the physical plane and the profile coordinates are obtained. Thickness and deflection are not restricted, since the full potential equation is used. R.J.F.

N85-15699# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
ANALYSIS OF THE FLOW FIELD ABOUT A T-45 USING PANAIR Final Report
W. W. Tseng, R. Llorens, and J. Gardner May 1984 29 p
(AD-A146811; NADC-84077-60) Avail: NTIS HC A03/MF A01 CSCL 20/4

It is the purpose of this report to document the work performed in utilizing the linear inviscid flow program called PANAIR on the analysis of the T-45 Hawk aircraft. This report summarizes the excellent agreement possible when using PANAIR to predict model pressure data in a wind tunnel at low Mach numbers. The Naval Air Development Center, under this IR program, is attempting to transition computational fluid dynamics research codes into practical and useful design/analysis tools. This report summarizes the work accomplished while utilizing PANAIR to predict the wing pressure distributions on the T-45 Hawk aircraft and then comparing these data to experimental wind tunnel results. The T-45 aircraft is part of a new Navy training system that will provide fixed wing jet flight training for intermediate and advanced phases of the Navy Integrated Flight Training System (NIFTS) to meet future pilot production requirements. Comparisons of the theoretical predictions obtained from PANAIR with experimental results show excellent agreement between the two data sets. GRA

N85-16240# Joint Publications Research Service, Arlington, Va.
PARACHUTE EXPEDITION TO ARCTIC
N. Selivanor *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 106-108 Transl. into ENGLISH from Daily Rev. (Moscow), v. 30, no. 131, 29 Jun. 1984 p 1-4 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

03 AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation.*

N85-15700 Department of the Air Force, Washington, D.C.
WINDBLAST LEG PROTECTOR ASSEMBLY Patent
R. J. Cummings, inventor (to Air Force) Issued 14 Aug. 1984 8 p Supersedes AD-D010307
(AD-D011376; US-Patent-4,465,250; US-Patent-Appl-SN-465230) Avail: US Patent and Trademark Office CSCL 06/17

This patent is for a windblast leg protector assembly for use by an occupant of an open-type ejection seat of an aircraft. The assembly includes, for each leg of the seat occupant, a modification to the occupant's conventional anti-acceleration suit by way of a piece of nylon fabric (with concave configurated load spreading cuts, and with a ring captured thereon) attached to the thigh portion, and a similar piece of nylon fabric with a ring captured thereon

attached to the calf portion, of each full length leg member of the anti-acceleration suit. Restraining-/retracting straps which are connected to, and which remain with the ejection seat, are also constituent components of the windblast leg protector assembly. Snap hooks, which are captured on the slack restraining/retracting straps, are releasably connected by the occupant, after sitting down in the ejection seat, to the captured rings on the thigh and the calf portions of the anti-acceleration suit being worn. During ejection, the slack restaining/retracting straps are automatically retracted and tensioned, thereby pulling downwardly on the captured rings, their retaining members, the leg members of the suit, and the legs of the occupant. As a result, the legs of the occupant are restrained, and thereby are prevented from being extended into the windblast. Although the thighs of the occupant are downwardly restrained during ejection, the calves of the seated occupant's legs move upwardly to relieve any tension load in the occupant's knees. GRA

N85-15701*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
FLOW OF NITROGEN-PRESSURIZED HALON 1301 IN FIRE EXTINGUISHING SYSTEMS
D. G. Elliott, P. W. Garrison, G. A. Klein, K. M. Moran, and M. P. Zydowicz 1 Nov. 1984 124 p refs
(Contract NAS7-918)
(NASA-CR-174271; JPL-Publ-84-62; NAS 1.26:174271) Avail: NTIS HC A06/MF A01 CSCL 01C

Halon 1301 which is a halocarbon fire extinguishing agent (CBrF3) used by the U.S. Army for vehicle fire suppression is discussed. Halon 1301 is discharged under nitrogen pressure, and the Halon-nitrogen mixture is a two phase, two component mixture that obeys compressible fluid laws and exhibits choking effects. A computer model was developed to analyze the discharge of Halon and nitrogen from a storage bottle through pipes and nozzles. The model agrees well with data from Halon 1301 discharge tests. The discharge time depends mainly on nozzle area and pipe volume, for given initial conditions. Graphs were developed for estimating discharge times. A nozzle employing multiple concentric converging/diverging nozzles was developed which gave hemispherical coverage. E.A.K.

N85-15702*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE UH-1H HELICOPTER ICING FLIGHT TEST PROGRAM: AN OVERVIEW
Robert J. Shaw and G. Paul Richter 1985 26 p refs Presented at the 23rd Aerospace Sci. Meeting, Reno, Nevada, 14-17 Jan. 1985; sponsored by AIAA, 14-17 Jan. 1985
(NASA-TM-86925; E-2421; NAS 1.15:86925; AIAA-85-0338) Avail: NTIS HC A03/MF A01 CSCL 01C

An ongoing joint NASA/Army program to study the effects of ice accretion on unprotected helicopter rotor aerodynamic performance is discussed. This program integrates flight testing, wind tunnel testing, and analytical modeling. Results are discussed for helicopter flight testing in the Canadian NRC hover spray rig facility to measure rotor aero performance degradation and document rotor ice accretion characteristics. The results of dry wind tunnel testing of airfoil sections with artificial ice accretions and predictions of rotor performance degradation using available rotor performance codes and the wind tunnel data are presented. An alternative approach to conducting future helicopter icing flight programs is discussed. B.W.

N85-15703# Imperial Coll. of Science and Technology, London (England). Dept. of Aeronautics.
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE AND EXPOSITION ON STRUCTURAL IMPACT AND CRASHWORTHINESS Final Report
G. A. O. Davies and J. Morton 26 Oct. 1984 15 p Proc. held in London, 16-20 Jul. 1984 Sponsored in part by Army
(Grant AF-AFOSR-0329-83)
(AD-A147845; EOARD-TR-85-03) Avail: NTIS HC A02/MF A01 CSCL 20/11

This report summarizes the main keynote papers and conference papers for the International Conference on Structural Impact and Crashworthiness, held at Imperial College of Science & Technology, London, U.K. Attendees had different interests in high and low velocity impact, low velocity crashworthiness of aircraft, trains, ships and helicopters, and high speed ballistic perforation. Most of the papers concerned metal impact in which plasticity and gross deformations control the energy absorbing process. There was one day devoted to composites (mostly glass and carbon/graphite) where energy absorption is quite different. Several full-scale tests were reported and filmed, including two U.K. crash tests reported for the first time in public: a nuclear fuel cell impacted at 100 mph by a complete train, and a drop test with a Lynx Helicopter. The Pending Boeing 720 crash test was reviewed. The growing reliability of numerical programs for predicting crash response was evident, but there is still a long way to go before computational programs become a design tool. It was clear that both in Europe and the U.S.A. the reliable use of finite element/finite difference codes for simulating crash cases is an urgent need, with an experimental validation used once only. GRA

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Spacecraft Communications, Command, and Tracking* and *32 Communications.*

N85-15704 Department of the Navy, Washington, D. C.
POLARIS GUIDANCE SYSTEM Patent
E. C. Hall, J. D. Sabo, S. A. Forter, R. R. Ragan, and J. H. Laning, inventors (to Navy) Issued 11 Sep. 1984 55 p
(AD-D011324; US-Patent-4,470,562; US-Patent-Appl-SN-502717; US-Patent-Class-244-3.2) Avail: US Patent and Trademark Office CSCL 17/7

This patent discloses a inertial guidance system for a rocket powered ballistic missile which provides navigation and control while the missile is proceeding in its flight trajectory. Signals are generated within the confines of the missile and without outside information representative of angular and linear motion of the missile with respect to an inertial frame of reference, a digital computer compares these signals to a preset parameter stored in the computer to provide control signals along the pitch and yaw axes. An autopilot uses these control signals to provide mechanical and control movements, and an exhaust nozzle deflection arrangement connected to the autopilot deflects the exhaust of the rocket for guidance along a predetermined flight trajectory. GRA

N85-15705# Federal Aviation Administration, Washington, D.C.
NATIONAL AIRSPACE SYSTEM CONFIGURATION MANAGEMENT INTERFACE CONTROL DOCUMENT. MAINTENANCE PROCESSOR SUBSYSTEM TO REMOTE MONITORING SUBSYSTEMS AND REMOTE MONITORING SUBSYSTEM CONCENTRATORS
1 Oct. 1984 69 p refs
(NAS-MD-790) Avail: NTIS HC A04/MF A01

The Remote Maintenance Monitoring System (RMMS) which provides the capability to automate and remotely control the periodic tasks of equipment performance monitoring and the recording of site data is described. On-site equipment monitoring employs controller scanning equipment referred to as Remote Monitorng Subsystem (RMS). All RMSs will communicate with a centrally located data processor, the Maintenance Processor Subsystem (MPS), either directly or through intermediate telecommunication multiplexors and concentrators. Data link control procedures to facilitate data communication between the MPS and an RMS are specified. Specifically, standard control procedures to perform the communications functions necessary for the

establisment and termination of transmissions, the transfer of messages, and the structuring, formatting, and encoding of messages are covered. Link level protocol for asynchronous and synchronous procedures are described separately. B.W.

N85-15706*# Research Triangle Inst., Research Triangle Park, N.C. Center for Systems Engineering.
EFFECTS OF AIRCRAFT AND FLIGHT PARAMETERS ON ENERGY-EFFICIENT PROFILE DESCENTS IN TIME-BASED METERED TRAFFIC
Fred R. DeJarnette Nov. 1984 19 p refs
(Contract NAS1-17023)
(NASA-CR-172338-Add; NAS 1.26:172338-Add; RTI/2467) Avail: NTIS HC A02/MF A01 CSCL 17G

The influence of several parameters on the time required to fly a nominal profile descent of a B-737 from an entry fix to a metering fix 75 n.mi. away was studied. The ground distance for the constant speed segment was adjusted in each case so that the aircraft would always arrive at the metering fix position at the completion of the five segments of the profile descent. The influence of eight parameters on the same nominal profile descent is outlined, but the method used for the off nominal cases was changed. The time calculated for the constant speed segment in the nominal case is used for all off nominal cases. This method allows the aircraft to arrive at the metering fix before or after the profile descent is complete. It is shown that descent Mach number and wind speed have a large effect on the time error, whereas weight was a much smaller effect. E.A.K.

N85-15707# Engineering and Economics Research, Inc., Vienna, Va.
NATIONAL AIRSPACE REVIEW: AIRPORT RADAR SERVICE AREA OPERATIONAL CONFIRMATION REPORT Final Report, Aug. 1983 - Oct. 1984
V. Bhartiya, R. Leasure, P. Lu, M. J. Rolls, and P. V. Tawari Washington FAA Oct. 1984 201 p
(Contract DTFA01-82-y-30562)
(DOT/FAA/AT-84/2) Avail: NTIS HC A10/MF A01

The airport radar service area (ARSA), a new concept in terminal airspace design and services to standarize the designation of controlled airspace services, rules, and procedures within which terminal radar traffic control is provided was confirmed. The operational confirmation assessed the accepability of the ARSA concept at two lead sites, Port Columbus International Airport, Columbus, Ohio, and Robert Muller Municipal Airport, Austin, Texas. The operational confirmation analysis of ARSA to determine its acceptance by users is presented. Data collection and analysis was geared towards two specific types: (1) opinion survey of local pilots, controller/staff, and supervisor/management at each of the facilities; and (2) lead site traffic activity profiles. It is concluded that ARSA is confirmed at Columbus, Ohio and Austin, Texas. E.A.K.

N85-15708# Royal Aircraft Establishment, Farnborough (England).
A DISCUSSION OF CONING ERRORS EXHIBITED BY INERTIAL NAVIGATION SYSTEMS
D. J. Flynn Mar. 1984 21 p
(AD-A147846; RAE-TM-RAD-NAV-243; DRIC-BR-92844) Avail: NTIS HC A02/MF A01 CSCL 17/7

The mechanisms by which so called coning errors occur in a strapdown inertial navigation system are explained by reference to a single mathematical theorem. Typical values of coning errors are derived and are shown to be significant for a 1 nm/h inertial navigator. Various methods of evaluating and reducing coning errors are discussed. GRA

N85-15709# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abt. Traegheitsortung und Navigation.
FLIGHT TESTING OF LITTON LASER GYRO STRAPDOWN SYSTEM LTN-90 FOR GENERAL AVIATION
Hans-Juergen Hotop Jul. 1984 43 p refs In GERMAN; ENGLISH summary Translation is in process as (ESA-TT-904) (DFVLR-Mitt-84-16) Avail: NTIS HC A03/MF A01; DFVLR, Cologne DM 17

The instruments and data evaluation used for flight testing of two Litton laser gyro strapdown navigation systems in a DO-28 aircraft are described. The reference data based on the platform navigation system CAROUSEL 4a are corrected by application of optimal smoothing techniques. Results of the LTN-90 flight tests are presented and graphs of one of the flight tests are discussed. Author (ESA)

N85-16027# Joint Publications Research Service, Arlington, Va.
OPTIMIZATION OF ORIENTATION IN NAVIGATION BY TWO HEAVENLY BODIES Abstract Only
N. A. Azbukina and V. A. Vasilyev *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 5 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 8, Aug. 1984 p 54-59 Original language document previously announced in IAA as A85-10473 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics.*

N85-15710 Department of the Air Force, Washington, D.C.
POWERED ARTICULATED HEADREST SYSTEM Patent
A. B. McDonald and J. T. Mannix, inventors (to Air Force) Issued 21 Aug. 1984 7 p Supersedes AD-D009220
(AD-D011353; US-Patent-4,466,662; US-Patent-Appl-SN-320893; US-Patent-Class-297-406) Avail: US Patent and Trademark Office CSCL 01/3

This patent is for a powered articulated headrest system for use with a seat structure having a backrest, such as the ejection seat of a high performance aircraft, e.g., a combat aircraft. The headrest system includes: a headrest assembly which is movably connected to the backrest; and, an electro-hydraulic actuator assembly for moving the headrest from an original (and normal) position above the backrest from an original (and normal) position above the backrest to any one of an infinite variety of positions which are rearward and downward of the headrest, and for moving the headrest from these other positions to the original position. The actuator assembly is controlled by the occupant of the seat, e.g., the pilot of the aircraft. When the headrest is moved rearwardly, unlike the prior art, the width of the headrest decreases thereby reducing any interference with aft visibility, and the height of the headrest also decreases thereby further reducing any interference with aft visibility and also eliminating any scrubbing action between the headrest and the head of the occupant of the seat. GRA

N85-15711 Department of the Air Force, Washington, D.C.
AIRCRAFT THRUST CONTROL SCHEME FOR TERRAIN FOLLOWING SYSTEM Patent
W. C. Kendig, inventor (to Air Force) Issued 21 Aug. 1984 11 p Supersedes AD-D009357
(AD-D011387, US-Patent-4,467,429; US-Patent-Appl-SN-339204; US-Patent-Class-364-433) Avail: US Patent and Trademark Office CSCL 01/3

This system permits speed variation within certain constraints. The minimum speed is derived from a stall avoidance or acceleration margin condition and the maximum speed may be the lower limit of the transonic region or other design limit. Assuming the throttle is set at or near a trim village, adjustments need only be made if the terrain following flight path is tending to drive the speed to one of the two velocity extremes. Velocity predictions are based on predicted kinetic energy being equal to the difference between the current kinetic energy and the potential energy to

the profile extreme. The throttle is adjusted when the predicted velocity is outside the limits to add or remove the required amount of energy. Author (GRA)

N85-15712# Royal Aircraft Establishment, Farnborough (England).
THE EFFECT OF CHANGES IN THE ANGLE OF INCIDENCE IN THE EVENT OF A RICHOCHET AT A FLOAT STEP
B. E. Pavlikevich Mar. 1984 11 p refs Transl. into ENGLISH from Gidromekhan. (USSR), v. 35, 1977 p 35-39
(RAE-Trans-2120; BR93462) Avail: NTIS HC A02/MF A01

The results obtained by B. Milvitsky for the symmetrical impact of a seaplane when there is a significant change in the angle of incidence on contact with the water are examined. An expression is derived for a general dimensionless parameter which characterize the single degree-of-freedom motion. An analytical expression is derived which relates the immersion depth to the rate of immersion of the step. R.S.F.

N85-15713*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
F-8 REFUELING BOOM GROUND VIBRATION TEST Final Report
Michael W. Kahoe Jan. 1985 50 p
(NASA-TM-84914; H-1194; NAS 1.15:84914) Avail: NTIS HC A03/MF A01 CSCL 01C

A ground vibration test was conducted on a simulated refueling boom mounted on an F-8 airplane. The ground vibration test was conducted to determine if the refueling boom modal frequencies were close to the airplane frequencies. The data presented in this report include modal frequencies, mode shape data, and structural damping coefficients. Author

N85-15714*# Boeing Commercial Airplane Co., Seattle, Wash.
SYSTEMS STUDY FOR AN INTEGRATED DIGITAL-ELECTRIC AIRCRAFT (IDEA)
G. E. Tagge, L. A. Irish, and A. R. Bailey Washington NASA Jan. 1985 206 p refs
(Contract NAS1-17528)
(NASA-CR-3840; NAS 1.26:3840; D6-52147) Avail: NTIS HC A10/MF A01 CSCL 01C

The results of the Integrated Digital/Electric Aircraft (IDEA) Study are presented. Airplanes with advanced systems were, defined and evaluated, as a means of identifying potential high payoff research tasks. A baseline airplane was defined for comparison, typical of a 1990's airplane with advanced active controls, propulsion, aerodynamics, and structures technology. Trade studies led to definition of an IDEA airplane, with extensive digital systems and electric secondary power distribution. This airplane showed an improvement of 3% in fuel use and 1.8% in DOC relative to the baseline configuration. An alternate configuration, an advanced technology turboprop, was also evaluated, with greater improvement supported by digital electric systems. Recommended research programs were defined for high risk, high payoff areas appropriate for implementation under NASA leadership. B.W.

N85-15715*# Hughes Helicopters, Culver City, Calif.
STUDY TO ELIMINATE GROUND RESONANCE USING ACTIVE CONTROLS
F. K. Straub Oct. 1984 123 p refs
(Contract NAS2-11261)
(NASA-CR-166609; NAS 1.26:166609) Avail: NTIS HC A06/MF A01 CSCL 01C

The effectiveness of active control blade feathering in increasing rotor body damping and the possibility to eliminate ground resonance instabilities were investigated. An analytical model representing rotor flapping and lead-lag degrees of freedom and body pitch, roll, longitudinal and lateral motion is developed. Active control blade feathering is implemented as state variable feedback through a conventional swashplate. The influence of various feedback states, feedback gain, and weighting between the cyclic controls is studied through stability and response analyses. It is shown that blade cyclic inplane motion, roll rate and roll acceleration feedback can add considerable damping to the system and eliminate ground resonance instabilities, which the feedback phase is also a powerful parameter, if chosen properly, it maximizes augmentation of the inherent regressing lag mode damping. It is shown that rotor configuration parameters, like blade root hinge offset, flapping stiffness, and precone considerably influence the control effectiveness. It is found that active control is particularly powerful for hingeless and bearingless rotor systems. E.A.K.

N85-15716*# National Aeronautics and Space Administration, Washington, D. C.
INSTALLED NACELLE DRAG-IMPROVEMENT TESTS OF AN M = 0.8 TURBOPROP TRANSPORT CONFIGURATION
Alan D. Levin and Ronald C. Smith Jan. 1983 378 p refs
(NASA-TM-84302; A-9127; NAS 1.15:84302) Avail: NTIS HC A17/MF A01 CSCL 01C

An unpowered semispan model of a representative turboprop configuration was tested to determine the effect of configuration modifications on the the nonmetric body and wing juncture. It is indicated that the jet off nacelle-installation drag can be approximately 25% of the cruise drag. However, the losses can be reduced to 17% by changes to the wing leading edge and nacelle intersection. Comparison of test results from a semispan nonmetric fuselage model with those from a full span metric fuselage show differences in angles of attack produced the same lift. It is found that the constant lift drag rise of the semispan model is higher because of the increased angle of attack to achieve the same lift. E.A.K.

N85-15717*# System Planning Corp., Arlington, Va.
SPEED BENEFITS OF TILT-ROTOR DESIGNS FOR LHX Final Briefing Report, Feb. 1982
R. L. McDaniel, J. V. Adams, A. Balberde, S. P. Dereska, C. J. Gearin, and D. E. Shaw Jan. 1983 81 p
(Contract NAS2-11020)
(NASA-CR-166437; NAS 1.26:166437; SPC-789) Avail: NTIS HC A05/MF A01 CSCL 01A

The merits of an advanced helicopter and a tilt rotor aircraft for light utility, scout, and attack roles in combat missions envisioned for the year 2000 and beyond were compared. It is demonstrated that speed has increasing value for 11 different mission classes broadly encompassing the intended LHX roles. Helicopter speeds beyond 250 knots are judged to have lower military worth. Since the tilt rotor concept offers a different cost speed relationship than that of helicopters, assessment of a tilt rotor LHX variant was warranted. The technical parameters of an advanced tilt rotor are stablished. Parameters of representative missions are identified, computed relative value of the tilt rotor LHX are compared to the baseline helicopter, a first-order life cycle estimate for the tilt rotor LHX is established, military worth of the alternative design is computed and the results are evaluated. It is suggested that the tilt rotor is the solution with the greatest capability for meeting the uncertainties of future needs. E.A.K.

N85-15718*# Lockheed-California Co., Burbank.
INTEGRATED TECHNOLOGY WING STUDY (ORAL PRESENTATION)
8 Apr. 1981 188 p
(Contract NAS1-16273)
(NASA-CR-169497; NAS 1.26:169497; LR-29801) Avail: NTIS HC A09/MF A01 CSCL 01C

The design of a plan for a commercial transport manufacturer to integrate advanced technology into a new wing for a derivative and/or new aircraft that could enter service in the late 1980s to early 1990s time period is proposed. The development of a new wing for a derivative or a new long range commercial aircraft and the incorporation of cost effective technologies are studied. The decision provides guidelines for the best allocation of research funds. E.A.K.

N85-15719# Army Aviation Engineering Flight Activity, Edwards AFB, Calif.
UH-60A EXTERNAL STORES SUPPORT SYSTEM FIXED PROVI-

SION FAIRINGS DRAG DETERMINATION Final Report, 30 Aug. - 22 Sep. 1983
R. A. Williams, R. MacMullin, J. O. Miess, R. M. Buckanin, and W. Y. Abbott May 1984 45 p
(AD-A147188; USAAEFA-82-15-1) Avail: NTIS HC A03/MF A01 CSCL 01/3

A comparative performance evaluation of the UH-60A helicopter in the normal utility configuration and with the External Stores Support System (ESSS) fixed provision fairings configuration (ESSS wings removed) was conducted at Edwards AFB, Cal. A total of eight flights were flown between 30 August and 22 September 1983, for a total of 10.0 productive hours. The increase in equivalent flat plate area due to installation of the ESSS fixed provision fairings was 2.5 sq. ft. With the ESSS fixed provision fairings installed at the out-of-ground effect hover guarantee conditions of 95 percent intermediate rated power at 4700 feet pressure altitude on a 35 deg C day, the hover capability was reduced 466 pounds. Incorporating the weight of the airframe fixed provisions will reduce the payload by 596.6 pounds or the equivalent of eliminating two combat equipped troops and 117 pounds of fuel or equipment. Author (GRA)

N85-15720# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
NyKINM, A FURTHER DEVELOPMENT OF KINM 22
Kjell Andersson Oct. 1984 37 p ref In SWEDISH; ENGLISH summary
(FOA-C-20559-D8(E3); ISSN-0347-3694) Avail: NTIS HC A03/MF A01

A simulation program of a robot attack against an aircraft, which can perform only one evasive action was developed. The robot is assumed to fulfill the proportional navigation condition all the time, its path is kinematic. Performance tests, input/output routines, and the mathematical relationship for the target path (and the robot path) are given. The simulation package makes it possible to integrate vectors. Author (ESA)

N85-15665# Ministry of Defence, London (England). Materials and Structures Dept.
OPERATIONAL LOADS MEASUREMENT: A PHILOSOPHY AND ITS IMPLEMENTATION
Dorothy M. Holford and J. R. Sturgeon *In* AGARD Operational Loads Data Aug. 1984 22 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15666# McDonnell Aircraft Co., St. Louis, Mo. Structural Dynamics and Loads Dept.
THE F-15 FLIGHT LOADS TRACKING PROGRAM
J. T. Johnston, R. E. Pinckert, and R. A. Melliere *In* AGARD Operational Loads Data Aug. 1984 7 p ref (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15667# National Aerospace Lab., Amsterdam (Netherlands).
STRUCTURAL LOAD MEASUREMENTS ON A NORTHROP NF-5A
D. J. Spiekhout *In* AGARD Operational Loads Data Aug. 1984 15 p (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15668# Naval Air Development Center, Warminster, Pa. Airframe Engineering Branch.
NAVY OPERATIONAL LOADS DATA SOURCES AND SYSTEMS
A. H. Johnson and M. J. Dubberly (Naval Air Systems Command) *In* AGARD Operational Loads Data Aug. 1984 20 p (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15669# Industrieanlagen-Betriebsgesellschaft m.b.H., Ottobrunn (West Germany).
OPERATIONAL LOADS DATA EVALUATION FOR INDIVIDUAL AIRCRAFT FATIGUE MONITORING
Richard Schuetz and Rolf Neunaber *In* AGARD Operational Loads Data Aug. 1984 23 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15670# Messerschmitt-Boelkow-Blohm G.m.b.H., Toulouse (France). Airbus Program.
STRUCTURAL FLIGHT LOAD MEASUREMENT DEMONSTRATION OF STRUCTURAL INTEGRITY
E. Rauscher *In* AGARD Operational Loads Data Aug. 1984 9 p (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15673# Canadair Ltd., Montreal (Quebec). Military Support, Technical Dept.
CF-5 VERTICAL STABILIZER FLIGHT LOAD SURVEY
N. Nguyen Trong *In* AGARD Operational Loads Data Aug. 1984 12 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15674# General Dynamics Corp., Fort Worth, Tex. F-16 Loads and Criteria Dept.
F-16 FORCE MANAGEMENT, YESTERDAY, TODAY AND TOMORROW
R. L. Culp *In* AGARD Operational Loads Data Aug. 1984 15 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15675# Army Research and Technology Labs., Fort Eustis, Va. Applied Technology Lab.
US ARMY HELICOPTER OPERATIONAL FLIGHT LOADS
Donald J. Merkley and Harold K. Reddick, Jr. *In* AGARD Operational Loads Data Aug. 1984 26 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15676# Westland Aircraft Ltd., Yeovil (England).
HELICOPTER DATA ACQUISITION IN WHL
F. S. Grainger *In* AGARD Operational Loads Data Aug. 1984 17 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15677# Messerschmitt-Boelkow-Blohm G.m.b.H., Bremen (West Germany). Load Criteria Section.
EVALUATION OF OPERATIONAL LOADS TO VERIFY STRUCTURAL DESIGN
H. Struck and H. Balke *In* AGARD Operational Loads Data Aug. 1984 16 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15678# Canadair Ltd., Montreal (Quebec).
TUTOR (CL-41A) TAIL FLIGHT LOAD SURVEY
A. Paquin and J. Skotnicki (National Defence Headquarters) *In* AGARD Operational Loads Data Aug. 1984 15 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15679# Avions Marcel Dassault, Saint-Cloud (France).
AEROELASTIC ANALYSIS AND THE IDENTIFICATION OF FLIGHT LOADS [ANALYSE AEROELASTIQUE ET IDENTIFICATION DES CHARGES EN VOL]
C Petiau and M. deLavigne *In* AGARD Operational Loads Data Aug. 1984 22 p refs In FRENCH (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography.*

N85-15721 Department of the Air Force, Washington, D.C.
BIODYNAMIC RESISTANT CONTROL STICK Patent
D. W. Repperger, inventor (to Air Force) Issued 16 Oct. 1984 20 p Supersedes AD-D010034
(AD-D011380; US-Patent-4,477,043; US-Patent-Appl-SN-449922; US-Patent-Class-244-223) Avail: US Patent and Trademark Office CSCL 01/3

This patent presents an improvement to an aircraft control stick is disclosed. Movement of an aircraft may generate a force which undesirably causes the aircraft pilot to deflect the aircraft's control stick, which thereby results in the aircraft deviating from the desired flight path. The present invention includes a processor-based system which employs an algorithm that generates a signal for causing the control stick to resist such forces. The invention includes a spring and damper connected to the control stick so that the spring constant and damping ratio may be varied. GRA

N85-15722# McDonnell Aircraft Co., St. Louis, Mo.
DISPLAY TECHNIQUES FOR ADVANCED CREW STATIONS (DTACS). PHASE 1: DISPLAY TECHNIQUES STUDY Final Technical Report, Apr. 1983 - Oct. 1984
E. C. Adam, H. E. Dillard, R. M. Velten, and J. Guenther Wright-Patterson AFB, Ohio AFWAL Mar. 1984 130 p
(Contract F33615-83-C-1040)
(AD-A146922; AFWAL-TR-84-1016) Avail: NTIS HC A07/MF A01 CSCL 01/3

The DTACS Final Report describes the study which explored advanced display techniques and their effect on future fighter/attack aircraft crew stations. The emphasis was placed on new and developing technology with applications to integrated avionics systems. Future mission requirements were reviewed, display requirements were established, display technologies were reviewed, an initial configuration of an advanced display was made and a plan for further development was also prepared. GRA

07 AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

N85-15723 Department of the Air Force, Washington, D.C.
MOUNTING CONSTRUCTION FOR TURBINE VANE ASSEMBLY Patent
D. S. Wolf, inventor (to Air Force) Issued 16 Oct. 1984 4 p Supersedes AD-D009948
(AD-D011395; US-Patent-4,477,222; US-Patent-Appl-SN-431435; US-Patent-Class-415-138) Avail: US Patent and Trademark Office CSCL 21/5

A turbine vane assembly of a gas turbine engine includes inner and outer shroud walls and a plurality of airfoil-shaped vanes extending between and connected at their opposite ends with the inner and outer shroud walls. The mounting construction of the vane ends to the respective shroud walls includes a plurality of recessed ledges defined in the shroud walls along respective ones of the ends of the vanes. Each ledge forms a gap between the respective wall and vane end extending from a trailing edge pressure side of the vane along the pressure side to a location approximately midway between the trailing and leading edges of the pressure side of the vane. The remainder of the vane end is rigidly connected to the respective shroud wall. Author (GRA)

N85-15724*# Tuskegee Inst., Ala. School of Engineering and Architecture.
AN IMPROVED COMPUTER MODEL FOR PREDICTION OF AXIAL GAS TURBINE PERFORMANCE LOSSES Final Report
R. M. Jenkins Aug. 1984 119 p refs
(Grant NsG-3295)
(NASA-CR-174246; NAS 1.26:174246) Avail: NTIS HC A03/MF A01 CSCL 21E

The calculation model performs a rapid preliminary pitchline optimization of axial gas turbine annular flowpath geometry, as well as an initial estimate of blade profile shapes, given only a minimum of thermodynamic cycle requirements. No geometric parameters need be specified. The following preliminary design data are determined: (1) the optimum flowpath geometry, within mechanical stress limits; (2) initial estimates of cascade blade shapes; and (3) predictions of expected turbine performance. The model uses an inverse calculation technique whereby blade profiles are generated by designing channels to yield a specified velocity distribution on the two walls. Velocity distributions are then used to calculate the cascade loss parameters. Calculated blade shapes are used primarily to determine whether the assumed velocity loadings are physically realistic. Model verification is accomplished by comparison of predicted turbine geometry and performance with an array of seven NASA single-stage axial gas turbine configurations. B.W.

N85-15725*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF STEADY-STATE TEMPERATURE DISTORTION ON INLET FLOW TO A HIGH-BYPASS-RATION TURBOFAN ENGINE
Ronald H. Soeder, Charles M. Mehalic, and Kevin Stancik (AFSC) Jan. 1985 32 p refs
(NASA-TM-86896; E-2369; NAS 1.15:86896) Avail: NTIS HC A03/MF A01 CSCL 21E

The effects of circumferential inlet temperature distortion on the flow characteristics between a distortion generator and a high bypass ratio turbofan engine and through its compression system were evaluated to support the effort to generate analytical models. The flow characteristics are defined by the inlet duct, the flow angles, and the total temperature, total pressure, and static pressure profiles in the inlet duct and through the fan and compressor. The effects of Reynolds number, rotor speed, and distortion extent are also considered. E.A.K.

N85-15726*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INTEGRATING CHEMICAL KINETIC RATE EQUATIONS BY SELECTIVE USE OF STIFF AND NONSTIFF METHODS
Krishnan Radhakrishnan 1985 15 p refs Presented at the 23rd Aerospace Sci. Meeting, Reno, Nev., 14-17 Jan. 1985; sponsored by AIAA
(NASA-TM-86923; E-2418; NAS 1.15:86923; AIAA-85-0237) Avail: NTIS HC A02/MF A01 CSCL 21E

The effect of switching between nonstiff and stiff methods on the efficiency of algorithms for integrating chemical kinetic rate equations was examined. Different integration methods were tested by application of the packaged code LSODE to four practical combustion kinetics problems. The problems describe adiabatic, and homogeneous gas phase combustion reactions. It is shown that selective use of nonstiff and stiff methods in different regimes of a typical batch combustion problem is faster than the use of either method for the entire problem. The implications which result in the development of fast integration techniques for combustion kinetic rate equations are discussed. E.A.K.

N85-15727*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL STUDY OF THE SPRAY CHARACTERISTICS OF A RESEARCH AIRBLAST ATOMIZER

Waldo A. Acosta 1985 16 p refs Proposed for presentation at the 30th Intern. Gas Turbine Conf. and Exhibit, Houston, Tex., 17-21 Mar. 1985; sponsored by ASME
(NASA-TM-86911; E-2404; NAS 1.15:86911; USAAVSCOM-TR-84-C-18) Avail: NTIS HC A02/MF A01 CSCL 21E

Airblast atomization was studied using a especially designed atomizer in which the liquid first impinges on a splash plate, then is directed radially outward and is atomized by the air passing through two concentric, vaned swirlers that swirl the air in opposite directions. The effect of flow conditions, air mass velocity (mass flow rate per unit area) and liquid to air ratio on the mean drop size was studied. Seven different ethanol solutions were used to simulate changes in fuel physical properties. The range of atomizing air velocities was from 30 to 80 m/s. The mean drop diameter was measured at ambient temperature (295 K) and atmospheric pressure. Author

N85-15728*# Pennsylvania State Univ., University Park.
THE STRUCTURE OF DILUTE COMBUSTING SPRAYS Final Report
J-S. Shuen, A. S. P. Solomon, and F. M. Faeth Jan. 1985 124 p refs
(Grant NAG3-190)
(NASA-CR-174838; NAS 1.26:174838) Avail: NTIS HC A06/MF A01 CSCL 21E

An experimental and theoretical study of drop processes in a turbulent flame is described. The experiments involved a monodisperse (105 and 180 micro m initial diameter) stream of methanol drops injected at the base of a turbulent methane-fueled diffusion flame burning in still air. The following measurements were made: mean and fluctuating phase velocities, mean drop number flux, drop-size distributions and mean gas-phase temperatures. Measurements were compared with predictions of two separated flow models: (1) deterministic separated flow, where drop-turbulence interactions are ignored; and (2) stochastic separated flow, where drop-turbulence interactions are considered using random-walk computations. The stochastic separated flow analysis yielded best agreement with measurements, since it provides for turbulent dispersion of drops which was important for present test conditions (and probably for most combusting sprays as well). Distinguishing the presence or absence of envelope flames around the drops, however, was relatively unimportant for present test conditions, since the drops spent most of their lifetime in fuel-rich regions of the flow where this distinction is irrelevant. Author

N85-15729*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
PREDICTED PERFORMANCE BENEFITS OF AN ADAPTIVE DIGITAL ENGINE CONTROL SYSTEM OF AN F-15 AIRPLANE Final Report
Frank W. Burcham, Jr., Lawrence P. Myers, and Ronald J. Ray Jan. 1985 11 p refs Prepared in cooperation with NASA, Ames Research Center
(NASA-TM-85916; H-1269; NAS 1.15:85916) Avail: NTIS HC A02/MF A01 CSCL 21E

The highly integrated digital electronic control (HIDEC) program will demonstrate and evaluate the improvements in performance and mission effectiveness that result from integrating engine-airframe control systems. Currently this is accomplished on the NASA Ames Research Center's F-15 airplane. The two control modes used to implement the systems are an integrated flightpath management mode and in integrated adaptive engine control system (ADECS) mode. The ADECS mode is a highly integrated mode in which the airplane flight conditions, the resulting inlet distortion, and the available engine stall margin are continually computed. The excess stall margin is traded for thrust. The predicted increase in engine performance due to the ADECS mode is presented in this report. Author

N85-15730# Battelle Columbus Labs., Research Triangle Park, N.C.
A COMPUTER PROGRAM FOR THE PERFORMANCE ANALYSIS OF SCARFED NOZZLES
J. D. Hoffman May 1984 376 p
(Contract DAAG29-81-D-0100)
(AD-A147370; AD-E950602; AMSMI/RK-CR-84-3) Avail: NTIS HC A17/MF A01 CSCL 09/2

An analysis is presented for predicting the performance of scarfed propulsive nozzles. The model assumes that the scarfing is not severe, so that the flow within the nozzle is axisymmetric. The flowfield within the nozzle and the scarfed nozzle extension is calculated by the method of characteristics. The oblique shock wave emanating from the junction of the nozzle and the scarfed nozzle extension is fitted discretely and tracked through the flowfield. The nozzle forces are determined by integrating the wall pressure distribution. Nozzle axial and side forces are calculated, and missile axial and side forces are determined. A computer program implementing the analysis is discussed. Fifteen sample cases are presented to illustrate the use of the computer program. Author (GRA)

N85-15731# Pratt and Whitney Aircraft, West Palm Beach, Fla. Government Products Div.
IMPROVEMENT OF THE CORROSION RESISTANCE OF TURBINE ENGINE BEARINGS Interim Report, Aug. 1981 - Jul. 1983
J. H. Mohn, H. M. Hodgens, II , H. E. Munson (TRW, Inc., Jamestown, N.Y.), and W. E. Poole Wright-Patterson AFB, Ohio AFWAL Feb. 1984 165 p Original contains color illustrations
(Contract F33615-81-C-2023)
(AD-A147430; PWA/GPD/FR-17952; AFWAL-TR-84-2014) Avail: NTIS HC A08/MF A01 CSCL 21/5

This technical report encompasses the work accomplished in the first phase of a two-phase program aimed at developing an alternate material, fabrication technique, or material treatment for turbine engine mainshaft bearings with improved corrosion resistance compared to state of the art VIM-VAR M50. During Phase 1, five corrosion-resistant bearing candidates (armoloy-coated M50, nickel sputter-coated M50, wrought CRB7, RSR565 and MRC2001) identified as the most promising were subjected to rolling contact fatigue, corrosion, hot hardness and wear screening tests. The phase concluded with selection of MCR2001 as the single most promising candidate for full-scale bearing fabrication and testing. In Phase 2 that candidate will be subjected to further full-scale bearing life and performance tests and a corrosion-resistant verification test. Author (GRA)

N85-15732# Naval Postgraduate School, Monterey, Calif.
CONTROL SYSTEM DESIGN LANGUAGE IMPLEMENTATION OF A GAS TURBINE STARTING CONTROLLER M.S. Thesis
R. P. Riley Jun. 1984 124 p
(AD-A147896) Avail: NTIS HC A06/MF A01 CSCL 09/2

This thesis investigates the feasibility and utility of the Computer System Design Language (CSDL) and its design environment. The primary purpose of this design system is to automatically design microprocessor-based controller prototypes given a description of the controller's behavior. CSDL is used to create a highly structured behavioral description which is used by the design environment to create a software and hardware listing. A generic gas turbine engine start malfunction controller is developed using CSDL and tested on a Prolog development system. GRA

N85-15733# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
ENGINE CYCLIC DURABILITY BY ANALYSIS AND TESTING
Loughton, England Sep. 1984 271 p refs In ENGLISH and FRENCH Conf. held in Lisse, Netherlands, 30 May - 1 Jun. 1984
(AGARD-CP-368; ISBN-92-835-0362-7) Avail: NTIS HC A12/MF A01

Engine utilization and accelerated mission testing development; critical material characterization; life assessment methodologies; and component and engine cyclic testing are discussed. The current state-of-the-art in technolgical areas is related to improving engine life. The technical and economical problems of advanced cyclic testing in the development of engines are considered with

focus on relationships between engine utilization and failure modes, accelerated mission testing development, critical material characteristics, component life assessment methods, recent results of component and engine cyclic testing, and future requirements. For individual titles, see N85-15734 through N85-15751.

N85-15734# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
IN-FLIGHT EVALUATION OF LCF LIFE CONSUMPTION OF CRITICAL ROTOR COMPONENTS SUBJECTED TO HIGH TRANSIENT THERMAL STRESS
G. E. Breitkopf and T. M. Speer *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 15 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

The calculation procedure under review offers the opportunity of a rapid approximation of transient temperatures and thermal stresses in the rotor structure of a gas turbine engine. The method can be implemented with the aid of a microprocessor system, permitting the Low Cycle Fatigue (LCF) life consumption of components subject to considerable thermal stresses, such as HP turbine and compressor stages, also to be calculated with good accuracy in flight. In view of the large scatter in the life consumption per hour flown and the large number of influencing parameters, concerning the hot section components, calculation of the life actually consumed per flight on completion of the flight would seem to be the only method that is simultaneously simple to handle and sufficiently accurate to enable the cyclic strength of the components to be used to the full. Author

N85-15735# Rolls-Royce Ltd., Bristol (England).
MONITORING ENGINE THERMAL STRESSES
T. M. Edmunds and R. A. Lawrence *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 20 p ref (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

The high performance and rapid response of modern military engines means that transient thermal stresses make a significant contribution to the fatigue life utilization of critical rotating components. This, coupled with the variability of actual usage, raises a requirement for calculating transient thermal stresses from flight recorded data. A computationally efficient procedure for meeting this requirement is described. The analysis is based on a simplified model of the heat transfer and mechanics of the engine that is tuned with results of more sophisticated finite difference and finite element computations. Applications to a engine disc are described using data collected by on-board recordings. The results are validated by comparisons with more detailed theoretical analyses - practical constraints preventing a direct measurement of in-flight stresses. The integration of the results into the overall lifting procedure is also briefly described. Author

N85-15736# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
ACCELERATED MISSION ENDURANCE TESTING (AMET)
Wilson R. Taylor *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 5 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

The cost of ownership of gas turbine aircraft engines today makes it imperative that the development process produce a production engine that will minimize life cycle cost. This problem was recognized and one of the most significant changes that was made in the last 10 years is the incorporation of AMET into the development programs. In the past, engine designs were qualified for production release when it successfully completed a 150 hour model test. However, as these engines accumulated service time, problems arose that were not discovered in factory test. It was apparent that the durability of these engines were not well understood. In 1973, the US Air Force, Navy, and Detroit Diesel Allison incorporated a new test cycle in their TF41 engine development program that was representative of the ircraft usage. The success of this effort encouraged the incorporation test method into other engine development programs. Today, the US Air Force uses factory test cycles for design verification and qualification that were derived from known or projected aircraft usages. The background of mission related testing, test cycle derivation, data sources, key parameters, limitations and benefits will be discussed. Author

N85-15737# Turbomeca S. A. - Brevets Szydlowski, Bordes (France).
DESIGN AND TEST REQUIREMENTS FOR DEVELOPMENT OF TODAY'S ENGINES [EXIGENCES DE CONCEPTION ET D'ESSAI POUR DEVELOPPER LES MOTEURS D'AUJOURD'HUI]
Jacques Fresco *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 14 p In FRENCH Original language doc. previously announced as N82-17205 (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

To adapt to the ever greater safety and profitability requirements for transport aircraft, the engine must fulfill two functions which are often of an opposite nature: performance and durability. The combination of these two lines of force: performance (translated in terms of fuel consumption or power) and durability, lead to the final objective which is cost reduction. Today, from the beginning of a new engine, it is necessary to quarantee potentials that are of the same order, if not superior, to those of engines which have already accumulated thousands of flight hours. The different methods that permit achieving the durability objective are analyzed including how they are involved in engine design. Tests which best reproduce the damage phenomena are described, and some examples are given which relate particularly to small engines. Transl. by A.R.H.

N85-15738# National Aerospace Lab., Amsterdam (Netherlands).
OVERVIEW OF THE AGARD SMP ACTIVITIES ON TURBINE ENGINE MATERIALS TECHNOLOGY IN THE 1972 - 1982 PERIOD
A. J. A. Mom *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 34 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

An overview of research on turbine engine technology over the last 10 years is given. These activities cover most of the material related aspects in gas turbine technology from the initial design stage up to the final retirement of components. The development and application of advanced materials; material properties and behavior; material processing and fabrication techniques; maintenance and repair; and life prediction methods are discussed. With respect to the advanced materials and fabrication techiques, attention is given to the directionally solidified in-situ composites, the ceramic materials and the powder metallurgy materials, and their different processing aspects. New fabrication techniques like hot isostatic pressing, superplastic forming and surface treatments are included. Furthermore the corrosion behavior and low cycle fatigue characteristics of engine materials, including methods to predict creep and fatigue behavior, e.g., the strain range partitioning method, are discussed. Finally, attention is given to maintenance, repair and life prediction of engine components. Emphasis is directed to the introduction of damage tolerance concepts to make a more economic use of inherently available component life than is presently done by the safe life philosphy. R.J.F.

N85-15739# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany). Materials Lab.
COMPARISON BETWEEN THE PROPERTIES OF CONVENTIONAL WROUGHT AND POWDER METALLURGICAL ALLOYS FOR TURBINE DISC APPLICATIONS c26
G. W. Koenig *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 11 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

Mechanical properties of powder-metallurgical nickel-base superalloys (e.g., U700PM; Rene 95) were evaluated in order to

predict the behavior of advanced aero-engine discs in comparison with conventional wrought nickel-base (e.g., Waspaloy; IN 718) discs. The assessment includes tensile strength, crack initiation and propagation fatigue life as well as the influence of mean stress. Special emphasis was put on the question about the scatter in fatigue lives resulting from defects in the material (e.g., oxide inclusions) and on the surface (e.g., grooves). The tolerance with respect to these defects was estimated on the basis of fracture mechanics methods. The potential of advanced nickel-base superalloys with respect to static strength and fatigue life is superior to that of currently used conventional wrought disc materials. It is shown that the most important requirement for the use of this fatigue potential is a high quality standard which limits the maximum size of defects both in the material and on the surface. The now available knowledge of the variable influencing the reliability of disc materials enables an optimization to obtain improved service behavior. Furthermore, the strength and quality of materials as well as the manufacturing process can be fitted to the requirements of each type of component. R.J.F.

N85-15740# Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Evry Cedex (France). Lab. des Materiaux et Procedes.

INCONEL 718 ALLOY RESISTANCE TO CRACK PROPAGATION [RESISTANCE A LA PROPAGATION DE FISSURES DE L'ALLIAGE INCONEL 718] c26

L. Poret, J. Y. Geudou, and A. Pineau (Ecole des Mines de Paris) *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 11 p refs In FRENCH (For primary document see N85-15733 07-07)

Avail: NTIS HC A12/MF A01

Resistance to crack propagation was studied in different nuances of Inconel 718 at high temperatures (550 C to 650 C) in fatigue, creep, and fatigue creep. Tests were conducted in both vacuum and air. A notable sensitivity to the effect of holding time was observed. This sensitivity depends on the microstructure of the alloy (hydrocarbon distribution, grain size and shape, the presence or absence of Beta phase, cold hardening) as well as the effects of oxidation. Fundamental data relating to propagation velocity were applied to a test disk on which premature priming led to the production of a crack until rupture. A calculation of contraints using the finite element method, the use of curves obtained from tests on test pieces, in conditions representing influences on the test pieces, permitted accounting for experimental observations (number of propagation cycles determined by counting streaks). A.R.H.

N85-15741# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

CUMULATIVE DAMAGE MODELING OF FATIGUE CRACK GROWTH

James M. Larsen and Theodore Nicholas *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 15 p refs (For primary document see N85-15733 07-07)

Avail: NTIS HC A12/MF A01

Life predictions of turbine engine structural components utilize fracture mechanics principles to determine fatigue crack growth rates. Fatigue cracks grow under conditions of variable temperature, frequency, hold time, stress ratio, and stress level. At elevated temperatures, time dependent material behavior can play a significant role in the material behavior. Cumulative damage models must account for all these variables as well as interaction effects. The earliest modeling involved interaction schemes, and, primarily, time independent material behavior. More recent work focused on time dependence and creep fatigue interaction effects. A review of current modeling concepts and problems is presented. R.J.F.

N85-15742# National Aeronautical Establishment, Ottawa (Ontario). Structures and Materials Lab.

PROBLEMS AND POSSIBILITIES FOR LIFE EXTENSION IN GAS TURBINE COMPONENTS

A. K. Koul, W. Wallace, and R. Thamburaj (Carleton Univ., Ottawa) *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 32 p refs (For primary document see N85-15733 07-07)

Avail: NTIS HC A12/MF A01

Data showing the beneficial effects of hot isostatic processing on the stress rupture properties of new and service exposed Ni based superalloy turbine blades are presented. Creep design methods that are generally used to highlight the service induced degeneration effects are critically analyzed. A new life prediction method that systematically analyzes the creep degeneration effects with increasing service life is proposed. Results indicating the successful application of a damage tolerance based maintenance methodology in Canadian Forces J85 engine compressor and turbine discs are discussed. Possibilities of enhancing engine component durability through improved machining techniques and reheat treatments are also discussed. Author

N85-15743# Royal Aircraft Establishment, Farnborough (England). Materials and Engineering Research Div.

DISC FATIGUE LIFE PREDICTIONS FOR GAS TURBINE ENGINES

W. J. Evans, M. E. F. Smith, and C. H. H. Williams *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 13 p refs (For primary document see N85-15733 07-07)

Avail: NTIS HC A12/MF A01

Safe cyclic lives for discs in gas turbine engines were determined. The current procedures which are based on a life-to-first-crack philosophy and, in Britain, require full scale component testing to establish a service safe life are reviewed. The limitations of this approach are highlighted. It is then suggested that an alternative method based on fatigue crack propagation should overcome some of the limitations. Before this alternative can be adopted, however, it is important to develop quantitative models for the types of crack that occur in engine discs. These cracks tend to be embedded, situated at stress concentration features and subjected to multiaxial stress fields. Some of the published work on such cracks is reviewed and the more relevant models detailed. An experimental program on the titanium alloy Ti-6-4 is then described in which the behavior of small cracks is evaluated for stress concentration features in bend specimens and model discs. R.S.F.

N85-15744*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ENGINE CYCLIC DURABILITY BY ANALYSIS AND MATERIAL TESTING

Albert Kaufman and Gary R. Halford *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 12 p refs Previously announced as N84-18683 (For primary document see N85-15733 07-07)

Avail: NTIS HC A12/MF A01 CSCL 21E

The problem of calculating turbine engine component durability is addressed. Nonlinear, finite-element structural analyses, cyclic constitutive behavior models, and an advanced creep-fatigue life prediction method called strainrange partitioning were assessed for their applicability to the solution of durability problems in hot-section components of gas turbine engines. Three different component or subcomponent geometries are examined: a stress concentration in a turbine disk; a louver lip of a half-scale combustor linear; and a squealer tip of a first-stage high-pressure turbine blade. Cyclic structural analyses were performed for all three problems. The computed strain-temperature histories at the critical locations of the combustor linear and turbine blade components were imposed on smooth specimens in uniaxial, strain-controlled, thermomechanical fatigue tests of evaluate the structural and life analysis methods. Author

N85-15745# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

LIFE PREDICTION AT HIGH TEMPERATURE UNDER MULTIAXIAL LOADING

Georges Cailletaud and Jean-Louis Chaboche *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 refs (For primary document see N85-15733 07-07)

Avail: NTIS HC A12/MF A01

The activities of ONERA concerning the life prediction of high temperature components are summarized. In the last few years, the viscoplastic finite element computer code EVPCYCL was developed which is suitable for any two-dimensional problem (plane stress or strain, axisymmetrical case). The code's main specificity is the choice of various possibilities concerning the consititutive equations: cyclic calculations can be made with kinematic and isotropic hardening, with the introduction of a memory effect, etc. Graphic post-processors are available as well as a life prediction program that takes into account creep and fatigue damage.Author

N85-15746# Brown Boveri Research Center, Baden (Switzerland).
EXPERIENCES WITH THE MATERIAL BEVAVIOUR AND HIGH TEMPERATURE LOW CYCLE FATIGUE LIFE PREDICTION OF THE IN 738 BLADING ALLOY c38
M. Y. Nazmy, H. Wettstein, and A. Wicki (Brown, Boveri and Co. Ltd, Baden, Switzerland) *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 12 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

The high temperature low cycle fatigue (HTLCF) behavior of the blading alloy IN 738 as studied in air at 850 C is studied. This aided in a basic understanding of the behavior of this alloy as well as the different methodologies used in life time prediction. Another part of the investigation was focused on the influence of different environmental effects on the (HTLCF) behavior. These environmental conditions were chosen to simulate as much as possible the actual conditions imposed on the gas turbine blades. Mainly sulfur containing environments were utilized for this purpose. Author

N85-15747# Rolls-Royce Ltd., Derby (England).
CYCLIC ENDURANCE TESTING OF THE RB211-22B CAST HP TURBINE BLADE c38
J. S. Ponsford and G. K. Waddington *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 11 p (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

During the design and development of a cast directionally solidified high pressure turbine blade for the Rolls-Royce RB211-22B engine, it was recognized that a method of proving the design beyond the normal endurance testing was required in order to simulate the total service life of the turbine blade. This led to the creation of the intensive cyclic endurance program. The aim of the program was to prove that the new HP turbine blade was capable of achieving the design objective of a 10,000 hour service life. The objectives of the program the definition of the endurance cycles and the automation used in running the cyclic test are discussed. The modifications incorporated to ensure that testing was kept representative of the service environment are considered. The results of the program which demonstrated that the design objective would be achieved in airline service are included. B.W.

N85-15748# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Turbine Engine Div.
VERIFICATION OF LIFE PREDICTION THROUGH COMPONENT TESTING c38
Richard J. Hill *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 9 p (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

A status on report on the results of current rig and component testing being conducted under the life assessment testing (LAT) approach to turbine engine durability validation is given. Focus is the combination of using material of reduced life capability and creatin conditions of higher stress to produce short-time failure for cost effective validation of the tools and rules of life prediction. The three components discussed are combustors, compressor disks and turbine blades. B.W.

N85-15749# Brown, Boveri und Cie, A.G., Mannheim (West Germany).
MECHANICAL ASPECTS OF HIGH TEMPERATURE COATINGS c26
K. Schneider and H. W. Gruenling *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 17 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

The strains that arise due to thermal expansion mismatch during the application of a coating are described. These strains cause cracks within a coating which reduce its ability to protect the base metal against a corrosion attack. The influence of the coating on the mechanical properties of the coated component is described. In general, a high temperature component is subjected to static loadings. The material undergoes creep, and in cyclic loadings, the component undergoes fatigue. In both cases a coating has some influence either through changes in the material properties due to a different heat treatment or through changes in the surface of a component due to the presence of the coating; hence a coating alters the conditions for crack initiation. From laboratory experience of high temperature coatings applied to gas turbine blades it can be shown that, depending on the type of coating and the method of application, the changes in materials might be positive, negative or negligible. B.W.

N85-15750# Societe Nationale d'Etudes et de Construction de Moteurs d'Aviation, Moissy-Cramayel (France).
CFM 56-2. OLIGOCYCLIC FATIGUE OF THE TURBOFAN DISK: DIMENSIONNING AND TESTS FOR VERIFICATION AND IMPROVEMENTS [CFM56-2 - FATIGUE OLIGOCYCLIQUE DU DISQUE DE SOUFFLANTE: DIMENSIONNEMENT ET ESSAIS POUR LA VERIFICATION ET LES AMELIORATIONS]
A. Guibert and G. Herman *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 13 p In FRENCH (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

Among other components, SNECMA developed the turbofan disk as part of the CFM56-2 program. Analysis of constraints and associated verifications were included from the start of the program by using finite element analysis techniques as well as sophisticated verification tests (photoelasticity). An important part of the analysis of life durability consisted of an understanding of the behavior of the material (studies of test pieces) and in the preparation of large scale oligocyclic tests. Results obtained in the latter tests allowed ultimate verification and improvement before engine certification. The combination of results thus obtained coherently demonstrated the life durability of the turbofan disk.
Transl. by A.R.H.

N85-15751# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Engineering Div.
VIEW OF FUTURE REQUIREMENTS FOR ENGINE CYCLIC DURABILITY BY ANALYSIS AND TESTING
T. E. Farmer *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 6 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

Future requirements of engine cyclic durability analysis and testing. These requirements must satisfy advancements in technology and configuration in a cost-effective manner. The importance are discussed of demonstrating engine durability is emphasized. It is essential that an integrated approach to durability verification be developed and involve component durability analysis, engine measured parameters, laboratory test and engine demonstrated capabilities. Automated analysis techniques must confidently relate test conditions to field operation; non-interference sensors and enhanced data acquisition systems are required for extended test periods; and engine testing must efficiently address sensitivities, operating limits and cyclic capabilities, Verified component durability prediction systems that are developed can reduce the number of required engine endurance tests. Through coordination of durability analysis, data acquisition and component demonstration testing, more complete knowledge of engine durability will be achieved in a cost-effective manner. B.W.

08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N85-15752*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
MORE THAN YOU WANT TO KNOW ABOUT MAXIMUM LIKELIHOOD ESTIMATION Final Report
Keaneth W. Iliff and Richard E. Maine Jan. 1985 26 p refs Presented at AIAA Atmospheric Flight Mech. Conf., Seattle, 21-23 Aug. 1984 Prepared in cooperation with NASA, Ames Research Center
(NASA-TM-85905; H-1252; NAS 1.15:85905; AIAA-Paper-84-2070-CP) Avail: NTIS HC A03/MF A01 CSCL 01C

The maximum likelihood estimator has been used to extract stability and control derivatives from flight data for many years. Most of the literature on aircraft estimation concentrates on new developments and applications, assuming familiarity with basic estimation concepts. Some of these basic concepts are presented. The maximum likelihood estimator is briefly discussed and the aircraft equations of motion that the estimator uses. The basic concepts of minimization and estimation are examined for a simple computed aircraft example. The cost functions that are to be minimized during estimation are defined and discussed. Graphic representations of the cost functions are given to help illustrate the minimization process. Finally, the basic concepts are generalized, and estimation from flight data is discussed. Some of the major conclusions for the computed example are also developed for the analysis of flight data. B.W.

N85-15753# California Univ., Los Angeles. Dept. of Electrical Engineering.
FLUTTER CONTROL WITH UNSTEADY AERODYNAMIC MODELS Ph.D. Thesis
Shyang Chang Oct. 1984 108 p
(Grant AF-AFOSR-0318-83)
(AD-A147858; AFOSR-84-1002TR) Avail: NTIS HC A06/MF A01 CSCL 20/4

This dissertation deals with a generic problem for aircraft: control laws for flutter suppression. Until recently, the system frequency response was approximated by rational functions so that the finite-dimensional L-Q-R theory could be applied. However, discrepancies between theory and practice, especially in transient response, has led to renewed interest in the problem. It would appear the L-Q-R theory would need infinite dimensional state space models. In this research, we first develop a time-domain model for unsteady aerodynamic loads and then couple it with a lumped model for the structural dynamics. We show that the solutions to the resulting input-output system, characterized by integro-differential equations, can be endowed with a state space which is a reflexive Banach space, and the state equations have a unique semigroup solution. We go on to examine the input-output stability for such a system. We show that input-output stability need not imply stability of the states. By a suitable approximation of the Sears function near the origin, we show that infinite dimensional (L2) L-Q-R theory can be applied. We derive optimal feedback control laws ensuring weak stability of the states, as well as input-output stability. GRA

N85-16048# Joint Publications Research Service, Arlington, Va.
INVESTIGATION OF SEMIAUTOMATIC AIRCRAFT CONTROL PROCESSES EMPLOYING TIME REDUNDANCY IN ON-BOARD DIGITAL TRAJECTORY CONTROL COMPUTERS Abstract Only
S. M. Fedorov, N. N. Sukhikh, and M. Yu. Smurov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 49 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 8, Aug. 1984 p 20-24 Original language document previously announced in IAA as A85-10470
(For primary document see N85-16025 07-33)
Avail: NTIS HC A06

09 RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

For related information see also *14 Ground Support Systems and Facilities (Space).*

N85-15754 Department of the Navy, Washington, D. C.
SYSTEM FOR RAPID REPAIR OF DAMAGED AIRFIELD RUNWAYS Patent
P. S. Springston, inventor (to Navy) Issued 13 Sep. 1983 5 p Supersedes AD-D009985
(AD-D011325; US-Patent-4,404,244; US-Patent-Appl-SN-437092; US-Patent-Class-428-109) Avail: US Patent and Trademark Office CSCL 01/5

A membrane of fiberglass-reinforced polyester resin is used as a trafficable cover over a compacted backfilled crater and crushed stone base to impart strength to the repair and prevent foreign object damage to aircraft. The membrane cover is usually prefabricated from several fiberglass matting layers of chopped fiberglass strands chemically bonded to woven fiberglass roving and impregnated with a polyester resin; an anchoring system consisting of holes along the cover perimeter and torque set rock bolts are used in conjunction with special steel bushings to secure the cover to airfield pavement surrounding the crater. GRA

N85-15755*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DESCRIPTION OF THE INSULATION SYSTEM FOR THE LANGLEY 0.3-METER TRANSONIC CRYOGENIC TUNNEL
Pierce L. Lawing, David A. Dress, and Robert A. Kilgore Jan. 1985 27 p refs
(NASA-TM-86274; L-15723; NAS 1.15:86274) Avail: NTIS HC A03/MF A01 CSCL 14B

The thermal insulation system of the Langley 0.3 Meter Transonic Cryogenic Tunnel is described. The insulation system is designed to operate from room temperature down to about 77.4 K, the temperature of liquid nitrogen at 1 atmosphere. A detailed description is given of the primary insulation system consists of glass fiber mats, a three part vapor barrier, and a dry positive pressure purge system. Also described are several secondary insulation systems required for the test section, actuators, and tunnel supports. An appendix briefly describes the original insulation system which is considered inferior to the one presently in place. The time required for opening and closing portions of the insulation system for modification or repair to the tunnel has been reduced, typically, from a few days for the original thermal insulating system to a few hours for the present system. Author

N85-15756*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THE WESTERN AERONAUTICAL TEST RANGE OF NASA AMES RESEARCH CENTER
Archie L. Moore Jan. 1984 18 p refs Presented at the 23rd AIAA Aerospace Sci. Meeting, Reno, Nev., 14-17 Jan. 1985
(NASA-TM-85924; H-1280; NAS 1.15:85924; AIAA-85-0316) Avail: NTIS HC A02/MF A01 CSCL 14B

An overview of the Western Aeronautical Test Range (WATR) of NASA Ames Research Center (ARC) is presented in this paper. The three WATR facilities are discussed, and three WATR elements - mission control centerns, communications systems, real-time processing and display systems, and tracking systems -are reviewed. The relationships within the NASA WATR, with respect to the NASA aeronautics program, are also discussed. Author

N85-15757*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYTICAL AND PHYSICAL MODELING PROGRAM FOR THE NASA LEWIS RESEARCH CENTER'S ALTITUDE WIND TUNNEL (AWT)
John M. Abbott, James H. Deidrich, John F. Groeneweg, Louis A. Povinelli, Lonnie Reid, John J. Reinmann, and John R. Szuch 1985 21 p refs Presented at the 23rd Aerospace Sci. Meeting, Reno, Nevada, 14-17 Jan. 1985; sponsored by AIAA
(NASA-TM-86919; E-2413; NAS 1.15:86919; AIAA-85-0379) Avail: NTIS HC A02/MF A01 CSCL 14B

An effort is currently underway at the NASA Lewis Research Center to rehabilitate and extend the capabilities of the Altitude Wind Tunnel (AWT). This extended capability will include a maximum test section Mach number of about 0.9 at an altitude of 55,000 ft and a -20 F stagnation temperature (octagonal test section, 20 ft across the flats). In addition, the AWT will include an icing and acoustic research capability. In order to insure a technically sound design, an AWT modeling program (both analytical and physical) was initiated to provide essential input to the AWT final design process. This paper describes the modeling program, including the rationale and criteria used in program definition, and presents some early program results. Author

N85-15758*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE NASA ALTITUDE WIND TUNNEL (AWT): ITS ROLE IN ADVANCED ICING RESEARCH AND DEVELOPMENT
Bernard J. Blaha and Robert J. Shaw 1985 21 p refs Presented at the 23rd Aerospace Sci. Meeting, Reno, Nevada, 14-17 Jan. 1985; sponsored by AIAA
(NASA-TM-86920; E-2414; NAS 1.15:86920; AIAA-85-0090) Avail: NTIS HC A02/MF A01 CSCL 14B

Currently experimental aircraft icing research is severely hampered by limitations of ground icing simulation facilities. Existing icing facilities do not have the size, speed, altitude, and icing environment simulation capabilities to allow accurate studies to be made of icing problems occurring for high speed fixed wing aircraft and rotorcraft. Use of the currently dormant NASA Lewis Altitude Wind Tunnel (AWT), as a proposed high speed propulsion and adverse weather facility, would allow many such problems to be studied. The characteristics of the AWT related to adverse weather simulation and in particular to icing simulation are discussed, and potential icing research programs using the AWT are also included. Author

N85-15759*# Integrated Circuit Engineering Corp., Scottsdale, Ariz.
FACILITY SAFETY STUDY
Oct. 1979 224 p refs
(Contract NAS8-32812)
(NASA-CR-174280; NAS 1.26:174280) Avail: NTIS HC A10/MF A01 CSCL 01E

The safety of NASA's in house microelectronics facility is addressed. Industrial health standards, facility emission control requirements, operation and safety checklists, and the disposal of epitaxial vent gas are considered. R.S.F.

N85-15760# Illinois Univ., Urbana. Dept. of Civil Engineering.
DEVELOPMENT OF A PRELIMINARY ALRS STABILIZED MATERIAL PAVEMENT ANALYSIS SYSTEM (SPAS) Final Report, Apr. 1982 - May 1983
B. J. Dempsey, D. Janssen, J. Thomas, P. Frey, and A. Ioannides Tyndall AFB, Fla. AF Engineering and Services Center Aug. 1984 171 p
(Contract FY8952-82-60024)
(AD-A147116; AFESC/ESL-TR-83-34) Avail: NTIS HC A08/MF A01 CSCL 01/5

This report is an analytical study of soil stabilization as used in Alternate Launch and Recovery Surface (ALRS) design. The study proposes that ALRS pavements can be designed using a mechanistic design approach and a stabilized pavement analysis system (SPAS) is proposed. Stabilized material properties (strength, modulus, fatigue), structural modeling and behavior concepts, and environmental factors (freeze-thaw, frost depth) are utilized in the SPAS development. Inputs required to establish a stabilized base thickness for an ALRS pavement (F-4 loading) are the field strength of the stabilized material and the E sub Ri (measure of resilient modulus) of the fine-grained subgrade. A properly designed ALRS pavement for F-4 loading can accommodate a limited number of C-130 and F-15 load applications. The SPAS thickness design concepts (based on an intact slab approach) are applicable to a broad range of cementitious-stabilized materials (soil-cement, lime-fly ash-aggregate, soil-lime mixtures, similar high strength and modulus SPAS F-4 thickness requirements appear reasonable. Further research and development activities are required to validate SPAS. Technical report ESL-TR-84-25, Response and Performance of Alternate Launch and Recovery Surfaces Containing Stabilized Material Layers, shall report on predicting structural responses for ALRS pavements using stabilized material. Validation of the research shall use information from Test Report ESL-TR-83-46, Performance Data for F-4 Load Cart Operations on Alternate Launch and Recovery Surfaces. GRA

N85-15761# Department of the Navy, Washington, D. C.
AIRCRAFT BARRICADE Patent Application
P. DiGiovanniantonic and W. J. Zimmer, inventors (to Navy) Filed 1 Aug. 1983 17 p
(AD-D011316; US-Patent-Appl-SN-519421) Avail: NTIS HC A02/MF A01 CSCL 01/5

A webbing system is disclosed for use as an aircraft barricade wherein a plurality of rectangularly-shaped engaging loops are arranged in a alternating, muli-planar array and suspended across a landing area in the path of an approaching aircraft upon an assembly of support loops stretched between a pair of stanchoins and connected on either side to an energy absorbing device. Slidably connected along upper and lower horizontal components of the support loops, the engaging loops are free to move laterally along the support loops toward the longitudinal axis of the aircraft when penetrated by the fuselage so that the aircraft is ensnared about is wings by the loops with equalized loading and its forward motion arrested. GRA

N85-15762# Naval Civil Engineering Lab., Port Hueneme, Calif.
HANGAR HEATING AND ENERGY CONSERVATION MANUAL Final Report, Oct. 1979 - Sep. 1983
J. L. Ashley Sep. 1984 110 p
(AD-A147893; AFESC/DEB-TR-84-01) Avail: NTIS HC A06/MF A01 CSCL 01/5

Hangars and similar structures require large amounts of energy for space heating. Energy conservation survey techniques for hangars are defined and technical data sheets are included which provide: (1) procedures to identify energy conservation deficiencies; (2) methods to calculate annual energy losses; (3) recommended solutions; and (4) methods to calculate annual energy savings. Author (GRA)

N85-15763# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany). Hauptabteilung Windkanaele.
EXPERIENCES WITH THE USE OF A SIDE-STRUT MODEL SUPPORT SYSTEM FOR HIGH ANGLES OF ATTACK IN THE TRINSONIK WIND TUNNEL TMK
Helmut Esch May 1984 53 p refs In GERMAN; ENGLISH summary Translation is in process as (ESA-TT-895)
(DFVLR-Mitt-84-09; ESA-TT-895) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 22

Experience with a relatively simple model support system for high angles of attack in a blowdown wind tunnel are presented. The advantages of low production costs and low operational costs as compared to the standard system face the disadvantages of increased aerodynamic interference and asymmetrical deformations. Interference tests show the limitations of the use of this system. It can be used in the supersonic domain, especially for higher Mach numbers. It is only conditionally usable in the transonic domain. Author (ESA)

12 ASTRONAUTICS (GENERAL)

For extraterrestrial exploration see *91 Lunar and Planetary Exploration.*

N85-15764*# Wyle Labs., Inc., Huntsville, Ala. Research and Engineering Div.
COMMERCE LABORATORY: MISSION ANALYSIS PAYLOAD INTEGRATION STUDY Monthly Progress Report, Nov. 1984
Tom C. Bannister Nov. 1984 4 p refs
(Contract NAS8-36109)
(NASA-CR-171298; NAS 1.26:171298) Avail: NTIS HC A02/MF A01 CSCL 22A

A mission model which will accommodate commercial users and provide a basic data base for further mission planning is reported. The data bases to be developed are: (1) user requirements; (2) apparatus capabilities and availabilities; and (3) carrier capabilities. These data bases are synthesized in a trades and analysis phase along with the STS flight apparatus, and optimum missions will be identified. The completed work is reported. The user requirements data base was expanded to identify within the six scientific disciplines the areas of investigation, investigation categories and status, potential commercial application, interested parties, process, and experiment requirements. The scope of the apparatus data base was expanded to indicate apparatus status as to whether it is ground or flight equipment and, within both categories, whether the apparatus is: (1) existing, (2) under development, (3) planned, or (4) needed. Applications for the apparatus are listed. The methodology is revised in the areas of trades and analysis and mission planning. The carrier capabilities data base was updated and completed. E.A.K.

N85-15765*# National Aeronautics and Space Administration, Washington, D. C.
BDLI MEMORANDUM ON THE FUTURE OF SPACE FLIGHT IN THE FEDERAL REPUBLIC OF GERMANY
Nov. 1984 64 p Transl. into ENGLISH of "BDLI-Memorandum zur Zukunft der Raumfahrt in der Bundesrepublik Deutschland" Bundesverband der Deutschen Luftfahrt-, Ramfahrt und Ausruestungsindustrie E.V., Bonn, 1984 p 1-90 Transl. by The Corporate Word, Inc., Pittsburgh
(Contract NASw-4006)
(NASA-TM-77624; NAS 1.15:77624) Avail: NTIS HC A04/MF A01 CSCL 22A

The future of the aerospace effort in the Federal Republic of Germany is reviewed. The status of the aerospace industry in the FRG is compared with that in other countries and various areas of research are explored in terms of their relevance to the German economy and to the FRG's position as a competitor in the world market. Author

N85-15766*# Ames Lab., Iowa.
FLOAT ZONE EXPERIMENTS IN SPACE Contractor Final Report, 1 Oct. 1983 - 30 Jun. 1984
J. D. Verhoeven, M. A. Noack, W. N. Gill, and C. C. Hau Sep. 1984 58 p refs
(NASA Order H-34328-B)
(NASA-CR-171284; NAS 1.26:171284; IS-4872; UC-25) Avail: NTIS HC A04/MF A01 CSCL 22A

The molten zone/freezing crystal interface system and all the mechanisms were examined. If Marangoni convection produces oscillatory flows in the float zone of semiconductor materials, such as silicon, then it is unlikely that superior quality crystals can be grown in space using this process. The major goals were: (1) to determine the conditions for the onset of Marangoni flows in molten tin, a model system for low Prandtl number molten semiconductor materials; (2) to determine whether the flows can be suppressed by a thin oxide layer; and (3) based on experimental and mathematical analysis, to predict whether oscillatory flows will occur in the float zone silicon geometry in space, and if so, could it be suppressed by thin oxide or nitride films. Techniques were developed to analyze molten tin surfaces in a UHV system in a disk float zone geometry to minimize buoyancy flows. The critical Marangoni number for onset of oscillatory flows was determined to be greater than 4300 on atomically clean molten tin surfaces. Author

N85-15767# Lockheed Missiles and Space Co., Palo Alto, Calif.
ON-ORBIT SUPPORT OF DARPA-301 PAYLOAD Final Report
W. L. Imhof, D. W. Datlowe, J. Mobilia, G. H. Nakano, and E. E. Gaines 28 Sep. 1984 25 p
(Contract N00014-84-C-0304)
(AD-A146897; LMSC/F018810) Avail: NTIS HC A02/MF A01 CSCL 22/1

This report covers the DARPA-301 payload on the P78-1 satellite. Several gamma-ray detectors with high sensitivity continue to perform well and are completely capable of fulfilling the mission objectives. These objectives are: (1) Provide the technical planning and liaison with the Air Force Satellite Control Facility and other government agencies as required for the on-orbit satellite support of the DARPA-301 payload; (2) Assess the on-orbit operation and quality of data from the DARPA-301 payload on the P78-1 satellite; (3) Provide support, including quick-look analysis and interactions with the Air Force Satellite Control Facility, for a regional event; and, (4) Perform regular analyses of the on-orbit data to maintain updated evaluations of the sensitivities and optimum configurations of the payload for mapping gamma-ray sources. GRA

N85-15768# National Park Service, Washington, D. C.
MAN IN SPACE: NATIONAL HISTORIC LANDMARK THEME STUDY
H. A. Butowsky May 1984 463 p refs
(PB85-107233/GAR; FNP-400/84) Avail: NTIS HC A20/MF A01 CSCL 14B

The Man in Space National Historic Landmark Theme Study was prepared for the Congress and the Secretary of the Interior's Advisory Board in partial fulfillment of the requirements of P.L. 96-344. The purpose of the Theme Study is to evaluate all resources which relate to the theme of Man in Space and to recommend certain of those resources for designation as National Historic Landmarks. The Man in Space Theme Study considered resources relating to the following general subthemes: (1) Technical Foundations before 1958, (2) The Effort to Land a Man on the Moon, (3) The Exploration of the Planets and Solar System, and (4) The Role of Scientific and Communications Satellites. The Theme Study attempts to identify the surviving resources that were necessary for the goals of landing a man on the Moon and exploring the Earth, planets and solar system to be accomplished. Author (GRA)

N85-15786# Office of Technology Assessment, Washington, D.C.
TOWARD A GOAL-ORIENTED CIVILIAN SPACE PROGRAM
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 113-129 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

13 ASTRODYNAMICS

Includes powered and free-flight trajectories; and orbit and launching dynamics.

N85-15769# Lincoln Lab., Mass. Inst. of Tech., Lexington.
TRISTATIC TRACKING FILTER USED BY THE MULTISTATIC MEASUREMENT SYSTEM
M. L. Smith 12 Sep. 1984 40 p
(Contract F19628-80-C-0002)
(AD-A146885; TR-699; ESD-TR-84-035) Avail: NTIS HC A03/MF A01 CSCL 16/3

This report describes the mathematical models and algorithms that comprise the ballistic tristatic tracking filter used by the Multistatic Measurement System at the Kiernan Re-entry Measurement Site. Originator - supplied keywords include: KREMS, TRADEX, ballistic trajectory, and ballistic Kalman filter. GRA

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE)

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.

For related information see also *09 Research Support Facilities (Air).*

N85-15770 Admiralty Marine Technology Establishment, Holton Heath (England).
CORROSION FATIGUE CRACK GROWTH RATES OF WELDMENTS IN QIN STEEL
B. F. Jones and J. C. Galsworthy Jun. 1983 35 p refs
(AMTE(M)-R-83003; BR90072) Copyright. Avail: Issuing Activity

Low frequency fatigue crack growth rates in air and sea water were determined for manual metal arc (MMA), synergic metal inert gas (MIG), electron beam (EB) and laser beam (LB) welds in QIN steel. The growth rates for the MMA, MIG and EB welds are not greatly different to those of the parent steel. The LB welded steel exhibits extremely rapid crack growth rates in sea water, when the fatigue crack was growing along the centerline of the weld. Stress corrosion crack growth is observed for EB and LB welds but not in MMA or MIG welds or in parent plate. Internal stresses in specimens from welds appear to influence crack growth rate, possibly by inducing closure of the crack faces during the positive part of the fatigue cycle during unloading and thus reducing the effective load range below the applied load range. When compared in seawater at R = 0.5, the fatigue crack growth rates for parent plate, MMA and MIG welds show very little scatter. Author (ESA)

N85-15771# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
NONDESTRUCTIVE DECELERATION OF A ROCKET SLED
Bert Anderson Aug. 1984 23 p refs In SWEDISH; ENGLISH summary
(FOA-C-20549-D3; ISSN-0347-3694) Avail: NTIS HC A02/MF A01

For studying the penetration of missiles through steel plates, sled tests were performed with a 1.5 scale model rocket. An impact velocity of 250 m/sec was required. The missile scale model was mounted on the sled which was accelerated on a 300 m long rail by two test rockets. The sled was decelerated by spurs plunging into sand before the end of the track, which caused the model to leave the sled and fly freely towards the target plate. Deceleration distance was 25 to 28 m. Author (ESA)

N85-16708# National Radio Astronomy Observatory, Charlottesville, Va.
POTENTIAL AFFILIATE STATIONS TO WORK WITH THE EVN
P. N. Wilkinson *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 111-113 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

15 LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

N85-15772*# Smithsonian Astrophysical Observatory, Cambridge, Mass.
THE INVESTIGATION OF TETHERED SATELLITE SYSTEM DYNAMICS Quarterly Report, 15 Aug. - 30 Nov. 1984
Enrico Lorenzini Nov. 1984 90 p refs
(Contract NAS8-36160)
(NASA-CR-171278; NAS 1.26:171278; QPR-1) Avail: NTIS HC A05/MF A01 CSCL 22B

Tethered satellite system (TSS) dynamics were studied. The dynamic response of the TSS during the entire stationkeeping phase for the first electrodynamic mission was investigated. An out of plane swing amplitude and the tether's bowing were observed. The dynamics of the slack tether was studied and computer code, SLACK2, was improved both in capabilities and computational speed. Speed hazard related to tether breakage or plasma contactor failure was examined. Preliminary values of the potential difference after the failure and of the drop of the electric field along the tether axis have been computed. The update of the satellite rotational dynamics model is initiated. E.A.K.

N85-15773*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NATURAL ENVIRONMENTAL CRITERIA FOR THE SPACE STATION DEFINITION AND PRELIMINARY DESIGN, REVISED
William W. Vaughan Sep. 1984 15 p refs
(NASA-TM-86460; NAS 1.15:86460) Avail: NTIS HC A02/MF A01 CSCL 22B

The natural environment design criteria requirements for use in the Space Station and its elements (SSPE) definition and preliminary design were studied. The atmospheric dynamic and thermodynamic environments, meteoroids, radiation, physical constants are addressed. A common and consistent set of natural environment criteria requirements are examined. E.A.K.

N85-15774*# Engineering and Economics Research, Inc., Vienna, Va.
UPPER ATMOSPHERE RESEARCH SATELLITE (UARS) TRADE ANALYSIS Final Report
Maura M. Fox and Jack Nebb 30 Nov. 1983 95 p refs
(Contract NAS5-26962)
(NASA-CR-175269; NAS 1.26:175269) Avail: NTIS HC A05/MF A01 CSCL 22B

The Upper Atmosphere Research Satellite (UARS) which will collect data pertinent to the Earth's upper atmosphere is described. The collected data will be sent to the central data handling facility (CDHF) via the UARS ground system and the data will be processed and distributed to the remote analysis computer systems (RACS). An overview of the UARS ground system is presented. Three configurations were developed for the CDHF-RACS system. The CDHF configurations are discussed. The IBM CDHF configuration, the UNIVAC CDHF configuration and the vax cluster CDHF configuration are presented. The RACS configurations, the IBM RACS configurations, UNIVAC RACS and VAX RACS are detailed. Due to the large on-line data estimate to approximately 100 GB, a mass storage system is considered essential to the UARS CDHF. Mass storage systems were analyzed and the Braegan ATL, the RCA optical disk, the IBM 3850 and the MASSTOR M860 are discussed. It is determined that the type of mass storage system most suitable to UARS is the automated tape/cartridge device. Two devices of this type, the IBM 3850 and the MASSTOR MSS are analyzed and the applicable tape/cartridge device is incorporated into the three CDHF-RACS configurations. E.A.K.

N85-15775# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AN ANALYSIS OF THE TECHNICAL TRAINING OF ENLISTED MINUTEMAN MISSILE MAINTENANCE PERSONNEL M.S. Thesis
P. M. Campbell and R. M. Gallagher Sep. 1984 161 p
(AD-A147078; AFIT/GLM/LSM/84S-8) Avail: NTIS HC A08/MF A01 CSCL 05/9

An exploratory study identified possible deficiencies and problem areas in the technical training received by enlisted Minuteman missile maintenance personnel. The authors of this thesis selected several of the topics recommended for further research in the AFHRL study. Results of a review of literature pertaining to the selected topics and of the survey instruments used to gather data from Minuteman missile maintenance personnel are reported in this thesis. The research focused on the formal technical training performed at Chanute AFB, Illinois, and at the Team Training Branch located at each of the six Minuteman missile bases. The research was limited to enlisted Minuteman missile

maintenance personnel in Air Force specialties 316xOG, Missile Systems Analyst Specialist; 443xOG, Missile Maintenance Specialist; and 445xOG, Missile Facilities Specialist. Enlisted personnel who were assigned to those Air Force specialties, and who possessed a three or a five skill level rating were surveyed regarding their opinion of the usefulness of their technical training. GRA

N85-15776# Technische Univ., Berlin (West Germany). Inst. fuer Luft- und Raumfahrt.
CONCEPT AND COST ANALYSIS OF AN ORBITING LUNAR STATION [KONZEPTION UND KOSTENANALYSE EINER RAUMSTATION IM MONDORBIT]
Joerg Dorbandt 2 Jul. 1984 99 p refs In GERMAN; ENGLISH summary
(ILF-Mitt-138) Avail: NTIS HC A05/MF A01

A orbiting lunar station project whose main tasks are spacecraft refueling and transport of goods is described. The station is part of a transportation system aimed at bringing Moon-made goods into geostationary orbit. The station elements and its progressive growth over a lifetime of 50 yr were analyzed. A cost model was developed for every year of the lifetime through a BASIC program, and a sensitivity study was carried out. Cost is $20 billion (1980). Author (ESA)

16 SPACE TRANSPORTATION

Includes passenger and cargo space transportation, e.g., shuttle operations; and rescue techniques.

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation.*

N85-15777*# Lockheed Engineering and Management Services Co., Inc., Houston, Tex.
COLUMBIA: THE FIRST 5 FLIGHTS ENTRY HEATING DATA SERIES. VOLUME 1: AN OVERVIEW
S. D. Williams Nov. 1984 483 p refs
(Contract NAS9-15800)
(NASA-CR-171820; NAS 1.26:171820; LEMSCO-19346-Vol-1) Avail: NTIS HC A21/MF A01 CSCL 22A

Entry heating flight data and wind tunnel data on the lower windward and upper lee side centerline, lower wing 50% and 80% semi-spans, side fuselage and payload bay door, Z-400 and 440 trace aft of X/L=0.2, and OMS Pod trace 3, are presented for the first five flights of the space shuttle orbiter. Heating rate distributions are presented in terms of normalized shock Reynolds number to show the sensitivity of heating to these parameters. The surface heating rates and temperatures were obtained via the JSC NONLIN/INVERSE computer program. Author

N85-15778*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF AERODYNAMIC AND ANGLE-OF-ATTACK UNCERTAINTIES ON THE MAY 1979 ENTRY FLIGHT CONTROL SYSTEM OF THE SPACE SHUTTLE FROM MACH 8 TO 1.5
Howard W. Stone and Richard W. Powell Jan. 1985 137 p refs
(NASA-TP-2365; L-15813; NAS 1.60:2365) Avail: NTIS HC A07/MF A01 CSCL 22B

A six degree of freedom simulation analysis was performed for the space shuttle orbiter during entry from Mach 8 to Mach 1.5 with realistic off nominal conditions by using the flight control systems defined by the shuttle contractor. The off nominal conditions included aerodynamic uncertainties in extrapolating from wind tunnel derived characteristics to full scale flight characteristics, uncertainties in the estimates of the reaction control system interaction with the orbiter aerodynamics, an error in deriving the angle of attack from onboard instrumentation, the failure of two of the four reaction control system thrusters on each side, and a lateral center of gravity offset coupled with vehicle and flow asymmetries. With combinations of these off nominal conditions, the flight control system performed satisfactorily. At low hypersonic speeds, a few cases exhibited unacceptable performances when errors in deriving the angle of attack from the onboard instrumentation were modeled. The orbiter was unable to maintain lateral trim for some cases between Mach 5 and Mach 2 and exhibited limit cycle tendencies or residual roll oscillations between Mach 3 and Mach 1. Piloting techniques and changes in some gains and switching times in the flight control system are suggested to help alleviate these problems. E.A.K.

17 SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING

Includes telemetry; space communications networks; astronavigation; and radio blackout.

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications.*

N85-15779*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHARACTERIZATION OF MMIC DEVICES FOR ACTIVE ARRAY ANTENNAS
Jerry Smetana, Everett Farr (Illinois Univ., Urbana), and Raj Mittra (Illinois Univ., Urbana) 1984 17 p refs Presented at the Anenna Appl. Symp., Monticello, Ill., 19-21 Sep. 1984; sponsored by Illinois Univ. and RADC
(NASA-TM-86907; E-2396; NAS 1.15:86907) Avail: NTIS HC A02/MF A01 CSCL 09F

Certain aspects of monolithic microwave integrated circuit (MMIC) interconnectivity were investigated. Considerations that lead to preserving the inherently reproducible characteristics of the MMIC are proposed. It is shown that at radio frequencies (RF) greater than 20 GHz, the transition from the MMIC device to other transmission media must be an accurate RF match. It is proposed that the RF match is sufficiently critical to include the transition as part of the delivered MMIC package. The model to analyze several transitions is presented. This model consists of a succession of abrupt discontinuities in printed circuit transmission lines. The analysis of these discontinuities is achieved by the Spectral Galerkin technique, to establish the modes and mode matching, to generate the generalized S parameters of the individual discontinuities. Preliminary results achieved with this method are presented. It is concluded that special effects should be coordinated by the active array antenna industry toward standardization of MMIC packaging and characterization. E.A.K.

N85-15780# Pacific Missile Test Center, Point Mugu, Calif.
PULSE CODE MODULATION TELEMETRY: PROPERTIES OF VARIOUS BINARY MODULATION TYPES
E. L. Law Jun. 1984 147 p
(W06-04)
(AD-A147214; PMTC-TP000025) Avail: NTIS HC A07/MF A01 CSCL 09/2

This report describes the results of a study that was conducted to determine the properties of several binary pulse code modulation types. The topics addressed include: (1) Radio frequency spectral occupancy, (2) Bit error rate versus intermediate frequency signal-to-noise ratio in a bandwidth equal to the bit rate, (3) Peak carrier deviation, (4) Effect of filtering on data quality, and (5) Frequency and phase modulation. GRA

N85-16028# Joint Publications Research Service, Arlington, Va.
ERRORS OF ANALOG OF INERTIAL COORDINATE SYSTEMS MODELED IN ASTRONAVIGATION SYSTEM Abstract Only
V. A. Karakashev, O. N. Anuchin, and T. V. Paderina *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 5 refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 8, Aug. 1984 p 60-65 Original language document previously announced in IAA as A85-10474 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16721# Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.
WATER MASERS AND DISTANCE MEASUREMENTS: THE IMPACT OF QUASAT
Mark J. Reid *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 181-184 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support.* For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics.*

N85-15781# Office of Technology Assessment, Washington, D.C.
CIVILIAN SPACE STATIONS AND THE US FUTURE IN SPACE
Nov. 1984 238 p refs
(OTA-STI-241; LC-84-601136) Avail: SOD HC $7.50

The U.S. aerospace industry is now beginning to position itself to provide space assets and services independently, and anticipates conducting in space investigations and commercial-industrial activities privately financed, either on its own or in combination with other business concerns. The leaders of the U.S. civilian space community have advanced the view that the next major logical step in space should be the acquisition of specific, permanent in space infrastructure: a civilian space station. The following aspects involved in a shift to civilian space station are discussed: space infrastructure, buyer's guide; uses and functions, international concepts, federal budgets, cost containment, and policies. For individual titles, see N85-15782 through N85-15792.

N85-15782# Office of Technology Assessment, Washington, D.C.
ISSUES AND FINDINGS
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 25-46 refs (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

Long-term space goals and objectives; international space cooperation; cost reductions; transitions from NASA to civilian management; low-Earth-orbit infrastructure; non-government policy studies; and creation of space policy study centers are discussed. B.G.

N85-15783# Office of Technology Assessment, Washington, D.C.
SPACE INFRASTRUCTURE
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 49-82 ref (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

Low-Earth-orbit environment; data management; communications; electromagnetic interference; attitude control and stabilization; power; thermal energy management; propulsion; life support systems; space transportation; and space infrastructure are examined. B.G.

N85-15784# Office of Technology Assessment, Washington, D.C.
A BUYER'S GUIDE TO SPACE INFRASTRUCTURE
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 85-99 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

Various factors involved in acquiring a substantial amount of long-term space infrastructure are considered. The roles of the private sector and international partners are discussed, and the degree to which new technology would be used is cited. The costs and capabilities of a number of possible infrastructure options are compared in a table format. The cost drivers associated with the listed options are discussed. Tradeoffs regarding the use of automation and people in a space station are considered. Buyers may reasonably decide to acquire space infrastructure using an average annual funding rate rather than a lump sum approach. Possible infrastructure that could be obtained using average annual funding rates of $0.1, $0.3, $1, and $3 billion (1984$) are presented. The functions that NASA intends to provide in a space station are listed, and alternative infrastructures that could provide those functions are indicated. B.W.

N85-15785# Office of Technology Assessment, Washington, D.C.
BROADENING THE DEBATE
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 103-110 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

The creation, a U.S. civilian space station program is described as a means to various ends rather than an end in itself. The ends proposed may be grouped into four categories: (1) industrial (e.g., manufacturing materials); (2) commercial (e.g., servicing satellites); (3) scientific (e.g., conducting experiments in the life sciences); and (4) national security (e.g., maintaining a permanent U.S. manned presence). Potential users and potential suppliers of a U.S. space station program are discussed. The need for goals and objectives for a new U.S. civilian space effort is considered. The role of U.S. space policy in the evolution of the present day civilian space program is discussed. President Reagan's call for a space station is addressed, and his directions on the nation's aspiration in regard to it are discussed. B.W.

N85-15786# Office of Technology Assessment, Washington, D.C.
TOWARD A GOAL-ORIENTED CIVILIAN SPACE PROGRAM c12
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 113-129 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

If the civilian space activities of the United States are to maintain widespread and enthusiastic public support, they should aspire to protect, ease, challenge, and/or improve the human condition. Long-range goals that would guide the conduct of the Nation's space activities in general are listed. Possible civilian space objectives that the United States (in cooperation with other countries, in most cases) could attain within the second quarter-century of the space age are discussed. Some of these objectives, if they are to be achieved, would require certain elements of inspace infrastructure; others, depending on how they would be carried out, may or may not require such elements; still others would require none. The manner in which the United States obtains any of this infrastructure is considered. Rough estimates for the cost of each conceptual objective are given, and the length of time over which each would be pursued is discussed. B.W.

N85-15787# Office of Technology Assessment, Washington, D.C.
RESULTS OF PRINCIPAL NASA STUDIES ON SPACE STATION USES AND FUNCTIONAL REQUIREMENTS
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 141-158 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

Working groups were established in 1982 to prepare for and coordinate a planning program to acquire a long term in-space inhabited structure, a civilian space station. To support its space station task force, as well as help clarify various issues, NASA authorized a series of parallel investigations of the potential desires for and characteristics of a space station. Eight aerospace companies and their subcontractors, in addition to Canada, the European Space Agency, and Japan studied the issues. Related investigations of possible nonaerospace industry interest were also conducted by consulting firms. Major findings of all these groups are presented. A.R.H.

N85-15788# Office of Technology Assessment, Washington, D.C.
THE EVOLUTION OF CIVILIAN IN-SPACE INFRASTRUCTURE, I.E., SPACE STATION CONCEPTS IN THE UNITED STATES
John Logsdon *In its* Civilian Space Stations and the US Future in Space Nov. 1984 p 159-176 refs (For primary document see

N85-15781 07-18)
Avail: SOD HC $7.50

The history of the concept of a space station is reviewed with emphasis on the rationales offered at various times for space infrastructure development. By sketching the earlier points in the evolution of the U.S. space program at which a space station was considered as a major project, only to be rejected in favor of another alternative, it may be possible to identify what is now different that might lead to a favorable evaluation of various proposals. The U.S. response to Sputnik, the Apollo project, space station plans during the 1960's, and the beginnings of post-Apollo planning are addressed. The Skylab program, which began with the launch of the Skylab workshop in 1973, is considered along with current space station planning. The role of various NASA administrators in the development of a space station is discussed. R.S.F.

N85-15789# Office of Technology Assessment, Washington, D.C.
INTERNATIONAL INVOLVEMENT IN A CIVILIAN SPACE STATION PROGRAM
Hubert Bortzmeyer *Ir. its* Civilian Space Stations and the US Future in Space Nov. 1984 p 177-205 refs (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

The motivations which lead nations to engage in international technical cooperation in general are enumerated. These motivations are then discussed as they apply to space infrastructure development. The record of international cooperation in space is presented along with U.S. objectives and interests related to international involvement in a U.S. space infrastructure acquisition program. Foreign objectives and interests related to involvement in a U.S. space station program are outlined. Possible modes of international involvement in a U.S. space station program are considered. The space program operated by ESA which deem it preferable to participate in talks with NASA on space station matters are given attention herein. Factors influencing the assessment of international involvement in the U.S. space station program are considered. R.S.F.

N85-15790# Office of Technology Assessment, Washington, D.C.
SYNOPSIS OF THE OTA WORKSHOP ON COST CONTAINMENT OF CIVILIAN INFRASTRUCTURE (CIVILIAN SPACE STATION) ELEMENTS
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 206-213 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

The major cost issues related to a U.S. civilian space station are summarized and discussed in terms of management, technical, and procurement considerations. Incentive contracting and performance specifications are considered. R.S.F.

N85-15791# Office of Technology Assessment, Washington, D.C.
TITLE 2: NATIONAL COMMISSION ON SPACE (PUBLIC LAW 98-361) c84
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 214-216 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

The establishment of a U.S. National Commission on Space is recorded. Findings of the Congress of the United States which relate to NASA, aerospace science, and long range planning are enumerated. The responsibilities, functions, legal limitations, and administrative framework of the commission are detailed. R.S.F.

N85-15792# Office of Technology Assessment, Washington, D.C.
FINANCING CONSIDERATIONS AND FEDERAL BUDGET IMPACTS c83
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 217-226 refs (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

Private sector funding and international funding of U.S. civilian space activities are discussed. The projected growth in private sector sales and related tax revenues is considered. Historical bases for a projection of sales growth in the private sector are given along with legal and experiential bases for Federal/private sector cooperation in economically directed research and development. Impacts on the Federal space budget are addressed. R.S.F.

N85-15793*# Ball Aerospace Systems Div., Boulder, Colo.
THERMAL AND CRYOGENIC DESIGN STUDY FOR SPACE INFRARED TELESCOPE FACILITY (SIRTF)
A. R. Urbach, T. Kelly, and R. Poley Nov. 1984 173 p refs
(Contract NAS2-11549)
(NASA-CR-166613; NAS 1.26:166613) Avail: NTIS HC A08/MF A01 CSCL 03A

A study was conducted to determine the ability of an all superfluid helium design to meet the performance requirements of background limited to 200 micrometer, and a two year lifetime for a one meter class free flying infrared observatory. Both a 98 deg and 28.5 deg inclination orbits were examined, and aperture shade designs were developed for both orbits. A unique forebaffle cooling design significantly reduces the sensitivity to aperture heat loads. With certain restrictions on observing modes, the study determined that an all superfluid helium Dewar will meet the temperature and lifetime requirements. A dual cryogen SFHe/SH2 system was also investigated for the 28.5 deg orbit and found to provide a more constant forebaffle temperature but with only a slight improvement in lifetime. Author

N85-15794*# Perkin-Elmer Corp., Danbury, Conn. Optical Group.
STUDY OF ALTERNATE OPTICAL AND FINE GUIDANCE SENSOR DESIGNS FOR THE SPACE INFRARED TELESCOPE FACILITY (SIRTF)
A. Wissinger, M. Steir, M. McFarlane, and A. Fuschetto Nov. 1984 152 p refs
(Contract NAS2-11551)
(NASA-CR-166614; NAS 1.26:166614) Avail: NTIS HC A08/MF A01 CSCL 03A

A unique optical design was developed that compensates for the coma degraded images caused by field chopping in SIRTF. The conic constants of a Cassegrain telescope were altered to compensate for the coma induced by the secondary mirror tilt. The modulation transfer function is essentially independent of secondary mirror tilt, and diffraction limited image quality is maintained over a several arcminute field during chopping. With an untilted secondary mirror, the coma compensated (CC) design has a smaller field than the unchopped Ritchey-Chretien design; but use of relay optics, such as the inverted Cassegrain design developed for the fine guidance sensor (FGS), can increase the CC telescope's field size. A reactionless secondary mirror chopper mechanism that uses superconducting magnets was studied. The heart producing elements are confined to a reaction plate that is not directly viewed by the IR focal plane. A design was also developed for a low moment of inertia, reticulated HIP beryllium secondary mirror consistent with blank fabrication technology and optical finishing requirements. B.W.

N85-15795*# Lockheed Missiles and Space Co., Palo Alto, Calif. Research and Development Div.
POINTING AND CONTROL SYSTEM DESIGN STUDY FOR THE SPACE INFRARED TELESCOPE FACILITY (SIRTF)
K. R. Lorell, J-N. Aubrun, B. Sridhar, and R. W. Cochran Nov. 1984 210 p refs
(Contract NAS2-11550)
(NASA-CR-166612; NAS 1.26:166612) Avail: NTIS HC A10/MF A01 CSCL 03A

The design and performance of pointing and control systems for two space infrared telescope facility vehicles were examined. The need for active compensation of image jitter using the secondary mirror or other optical elements was determined. In addition, a control system to allow the telescope to perform small angle slews, and to accomplish large angle slews at the rate of 15 deg per minute was designed. Both the 98 deg and the 28 deg inclination orbits were examined, and spacecraft designs were developed for each. The results indicate that active optical

compensation of line-of-sight errors is not necessary if the system is allowed to settle for roughly ten seconds after a slew maneuver. The results are contingent on the assumption of rigid body dynamics, and a single structural mode between spacecraft and telescope. Helium slosh for a half full 4000 liter tank was analyzed, and did not represent a major control problem. R.S.F.

N85-15796*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPACE STATION TRUSS STRUCTURES AND CONSTRUCTION CONSIDERATIONS
Martin M. Mikulas, Jr., Scott D. Croomes, William Schneider, Harold G. Bush, Kornell Nagy, Timothy Pelischek, Mark S. Lake, and Clarence Wesselski Jan. 1985 119 p refs Prepared in cooperation with NASA. Johnson Space Center
(NASA-TM-86338; NAS 1.15:86338) Avail: NTIS HC A06/MF A01 CSCL 22B

Although a specific configuration has not been selected for the Space Station, a gravity gradient stabilized station as a basis upon which to compare various structural and construction concepts is considered. The Space Station primary truss support structure is described in detail. Three approaches (see sketch A) which are believed to be representative of the major techniques for constructing large structures in space are also described in detail so that salient differences can be highlighted. B.W.

N85-15797# Department of the Air Force, Washington, D.C.
EROSION-RESISTANT NOSETIP CONSTRUCTION Patent Application
A. R. Taverna, inventor (to Air Force) Filed 22 Aug. 1984 15 p
(AD-D011346; US-Patent-Appl-SN-643140) Avail: NTIS HC A02/MF A01 CSCL 22/2

A pierced fabric carbon-carbon structure is selectively loaded with a particulate material to provide resistance to erosion. This invention relates to carbon-carbon composite materials, particularly reinforced carbon-carbon composites for reentry vehicle nosetips. Recent advances in the field of aerospace technology have created a need for high strength, temperature-resistant materials that possess the necessary properties needed to protect reentry vehicles from the severe thermomechanical stresses encountered within the reentry environment. A wide variety of reinforced, three-dimensional composite structures are now available. These composites generally consist of graphite fiber reinforcement which is oriented in at least three directions and a graphite matrix. GRA

19 SPACECRAFT INSTRUMENTATION

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography.*

N85-15798*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
NATURAL INTERFERENCE PHENOMENA AFFECTING SPACEBORNE RECEIVERS
J. M. Stacey 1 Nov. 1984 20 p refs
(Contract NAS7-918)
(NASA-CR-174256; JPL-Publ-84-67; NAS 1.26:174256) Avail: NTIS HC A02/MF A01 CSCL 22B

Earth orbiting microwave receivers which are vulnerable to the interference from natural sources, mainly, the Sun and the Moon, are discussed. The irradiance from the Sun affects microwave receivers in two ways: (1) the infrared component of the irradiance causes nonuniform heating in metal structures and produces distortions that affect electrical performance; and (2) the graybody radiation component of the solar irradiance enters the collecting aperture of the antenna and the feed ports of the calibration circuits. The graybody radiation operates to degrade the signal to noise ratios and vitiate the internal calibration accuracy. The magnitudes of interference from the Sun and the Moon are analyzed and mathematical expressions are derived which serve to quantify the expected interference levels. E.A.K.

20 SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

For related information see also *07 Aircraft Propulsion, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

N85-15799 Department of the Air Force, Washington, D.C.
CARBON/CARBON ROCKET MOTOR EXIT CONE REINFORCEMENT Patent
P. F. ODriscoll, G. E. Crowe, and J. Berry, inventors (to Air Force) Issued 16 Oct. 1984 4 p Supersedes AD-D010269
(AD-D011360; US-Patent-4,477,024; US-Patent-Appl-SN-482375) Avail: US Patent and Trademark Office CSCL 21/8

A carbon-carbon rocket motor exit cone having a threaded cylindrical section for attachment to the motor section is reinforced with a plurality of windings of carbon fiber around the cylindrical section. Author (GRA)

N85-15800# Electrotechnical Lab., Ibaraki (Japan).
STUDY ON CONTROL OF ION ENGINE SYSTEM
Kazuo Machida Aug. 1984 128 p refs In JAPANESE; ENGLISH summary
(EL-847; ISSN-0366-9106) Avail: NTIS HC A07/MF A01

Advanced propulsion systems which are applicable to large scale and long life satellites in space activities were examined. Electric thrusters are the only known practical propulsions which can achieve the specific impulse in excess of 1,000 sec. Various types of electric thrusters, including ion engines and plasma engines, were developed. The ion engine is an electric thruster whose propellant is ionized and accelerated by the electrostatic field. The ion engine system is applied to the auxiliary propulsion for the station keeping of geosynchronous satellites. The following topics are discussed: (1) optimization of ion propulsion system; (2) control of ion engine; (3) design of autonomous control system; (4) fabrication of power conditioners and system integration; and (5) simulation system. E.A.K.

N85-15801*# Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
HIGH ALTITUDE CHEMICALLY REACTING GAS PARTICLE MIXTURES. VOLUME 1: A THEORETICAL ANALYSIS AND DEVELOPMENT OF THE NUMERICAL SOLUTION
S. D. Smith Aug. 1984 228 p refs 3 Vol.
(Contract NAS9-16256)
(NASA-CR-171826; NAS 1.26:171826;
LMSC-HREC-TR-D867400-1-Vol-1) Avail: NTIS HC A11/MF A01 CSCL 04A

The overall contractual effort and the theory and numerical solution for the Reacting and Multi-Phase (RAMP2) computer code are described. The code can be used to model the dominant phenomena which affect the prediction of liquid and solid rocket nozzle and orbital plume flow fields. Fundamental equations for steady flow of reacting gas-particle mixtures, method of characteristics, mesh point construction, and numerical integration of the conservation equations are considered herein. R.S.F.

N85-15802*# Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
HIGH ALTITUDE CHEMICALLY REACTING GAS PARTICLE MIXTURES. VOLUME 2: PROGRAM MANUAL FOR RAMP2
S. D. Smith Oct. 1984 301 p refs 3 Vol.
(Contract NAS9-16256)
(NASA-CR-171827; NAS 1.26:171827;
LMSC-HREC-TR-D867400-2-Vol-2) Avail: NTIS HC A14/MF A01 CSCL 04A

All of the elements used in the Reacting and Multi-Phase (RAMP2) computer code are described in detail. The code can be used to model the dominant phenomena which affect the

prediction of liquid and solid rocket nozzle and orbital plume flow fields. R.S.F.

N85-15803*# Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
HIGH ALTITUDE CHEMICALLY REACTING GAS PARTICLE MIXTURES. VOLUME 3: COMPUTER CODE USER'S AND APPLICATIONS MANUAL
S. D. Smith Oct. 1984 431 p refs 3 Vol.
(Contract NAS9-16256)
(NASA-CR-171828; NAS 1.26:171828; LMSC-HREC-TR-D867400-3-Vol-3) Avail: NTIS HC A19/MF A01 CSCL 04A

A users manual for the RAMP2 computer code is provided. The RAMP2 code can be used to model the dominant phenomena which affect the prediction of liquid and solid rocket nozzle and orbital plume flow fields. The general structure and operation of RAMP2 are discussed. A user input/output guide for the modified TRAN72 computer code and the RAMP2F code is given. The application and use of the BLIMPJ module are considered. Sample problems involving the space shuttle main engine and motor are included. R.S.F.

N85-15804*# Little (Arthur D.), Inc., Cambridge, Mass.
PRELIMINARY EVALUATION OF A LIQUID BELT RADIATOR FOR SPACE APPLICATIONS Final Report
W. Peter Teagan and Kevin Fitzgerald Dec. 1984 180 p refs
(Contract NAS3-22253)
(NASA-CR-174807; NAS 1.26:174807) Avail: NTIS HC A09/MF A01 CSCL 10B

The liquid belt radiator (LBR) is discussed. The LBR system operates either in the sensible heat mode or in the latent heat mode. Parametric analysis shows that the LBR may reduce the mass of heat pipe radiators by 70 to 90% when the LBR surface has a total emissivity in excess of 0.3. It is indicated that the diffusion pump oils easily meet this criteria with emissivities greater than 0.8. Measurements on gallium indicate that its emissivity is probably in excess of 0.3 in the solid state when small amounts of impurities are on the surface. The point design exhibits a characteristic mass of 3.1 kg/kW of power dissipation, a mass per unit prime radiating area of approximately 0.9 kg/sq ms and a total package volume of approximately 2.50 cubic m. This compares favorably with conventional technologies which have weights on the order of 4 kg/sq m. E.A.K.

N85-15805*# National Aeronautics and Space Administration, Washington, D. C.
ION THRUSTER PROJECT
G. E. Perche Sep. 1984 9 p Transl. into ENGLISH of "Projeto de um propulsor ionico" rept. INPE-2803-PRE/363 Brazil, Jul. 1983 16 p Previously announced as N84-11205 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prepared by Inst. de Pesquisas Espaciais, Sao Jose dos Campos, Brazil
(Contract NASw-3542)
(NASA-TM-77726; NAS 1.15:77726; INPE-2803-PRE/363) Avail: NTIS HC A02/MF A01 CSCL 21C

The mercury bombardment electrostatic ion thruster is the most successful electric thruster available today. A 5 cm diameter ion thruster with 3,000 specific impulse and 5mN thrust is described. The advantages of electric propulsion and the tests that will be performed are also presented. Author

N85-15806*# Hughes Research Labs., Malibu, Calif.
EXTENDED PERFORMANCE TECHNOLOGY STUDY 30-cm THRUSTER Final Report, 26 Jun. 1979 - 26 Oct. 1982
J. R. Beattie Jun. 1983 201 p refs
(Contract NAS3-21943)
(NASA-CR-168259; NAS 1.26:168259) Avail: NTIS HC A10/MF A01 CSCL 21C

The extended performance technology study was an investigation of advanced discharge chambers and thruster components that were designed to operate under conditions which result in an increase in the thrust and thrust to power ratio of the state of the art J-series thruster. The high level of performance was achieved by a discharge chamber that employs a ring cusp magnetic confinement arrangement and a three grid ion extraction assembly. It is shown that the ring cusp magnetic field geometry confines the plasma to the volume immediately adjacent to the ion extraction assembly. A high emission current hollow cathode that demonstrated operation at an emission current as high as J sub E = 40 A, and measurements which show the breakdown voltage of individual sections of the J-series propellant flow electrical isolator is about 340 V per section are investigated. E.A.K.

N85-15807# Technische Hochschule, Aachen (West Germany). Inst. fuer Aufbereitung, Kokeri und Brikettierung.
INVESTIGATIONS INTO THE IMPROVEMENT OF PROCESSING OF BOLIVIAN TIN ORES Final Report, Dec. 1983
Andreas Jungmann, Kornelia Schepe, Ralf Gorny, and Dietrich Mueller (Stolberg Ingenieurberatung GmbH) Bonn Bundesministerium fuer Forschung und Technologie Sep. 1984 187 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-84-184; ISSN-0340-7608) Avail: NTIS HC A09/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 35

Tin losses in the Bolivian cassiterite flotation is dealt with. Flotation tests were carried out and pretreatment of cassiterite ore fines before flotation was reduced. It is found that a suitable reagent combination decreases collector consumption and improves the selectivity of the cassiterite flotation. A higher amount of ultrafines in the feed is obtained. Preconcentrate of cyclone overflows is upgraded by > 4% Sn and an electrolytic surface reduction is obtained. Author (ESA)

N85-15808# Erno Raumfahrttechnik G.m.b.H., Bremen (West Germany).
QUALIFICATION OF AN ELECTROTHERMAL HYDRAZINE THRUSTER WITH A VACUUM THRUST OF 0.5 TO 2.0 N Final Report, Dec. 1981
Peter Tiedtke Bonn Bundesministerium fuer Forschung und Technologie Oct. 1984 74 p In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-W-84-043; ISSN-0170-1339) Avail: NTIS HC A04/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 15,50

A thermally optimized electrothermal hydrazine thrustor prototype with a vacuum thrust of 0.5 to 2.0 N was manufactured and subjected to hot firing tests at different supply pressures and startup temperatures. The test results show an excellent thrustor performance; the proposed technical requirements are substantially exceeded. This is due especially to the development of a heat capacity consisting of iridium agglomerates. Start properties at start temperatures as low as 100 C are demonstrated. The thermal optimization proves to be very advantageous. Author (ESA)

N85-15809# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
RAMJET AND RAMROCKET PROPULSION SYSTEMS FOR MISSILES
Loughton, England Oct. 1984 241 p refs In ENGLISH and FRENCH Lectures held in Monterey, Calif., 5-6 Sep. 1984, in London, 10-11 Sep. 1984, and in Neubiberg, West Germany, 13-14 Sep. 1984
(AGARD-LS-136; ISBN-92-835-0360-0) Copyright. Avail: NTIS HC A11/MF A01

An introduction is given to modern Ramjet technology. Applications to missiles are especially emphasized. Various types of Ramjets are surveyed and characterized and Ramjet components are discussed, as well as the main types of subsonic combustion Ramjets and supersonic combustion Ramjets. For individual titles, see N85-15810 through N85-15817.

N85-15810# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Unternehmensbereich Apparate.
RAMJET AND RAMROCKET PROPULSION SYSTEMS FOR MISSILES: INTRODUCTION AND OVERVIEW
B. Crispin *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 13 p refs (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

Different types of Ramjet propulsion and their main features are described. After a survey of the development of the design principles, the fields of application are mentioned and comparisons with other types of missiles propulsion are made. The performance characteristics and the qualification of Ramjet propulsion for different missions are discussed. The present state of development and the points of emphasis of further development are discussed. R.J.F.

N85-15811# Marquardt Corp., Van Nuys, Calif.
RAMJET AIR INDUCTION SYSTEM DESIGN FOR TACTICAL MISSILE APPLICATION
J. G. Bendot, A. E. Heins, Jr., and T. G. Piercy *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 49 p refs (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

The design and performance of Ramjet air injection systems for tactical missile applications are discussed. Propulsion system requirements, design/mission characteristics, and design/performance tradeoff parameters are discussed. The major conclusion is that a high performance, ducted rocket ejector/mixer subsystem can be developed using any number of well developed, well integrated inlets. However, it is noted that ejector mixer performance with twin, and in particular, single inlet configurations, is more sensitive to ejector nozzle geometry. R.J.F.

N85-15812# Royal Aircraft Establishment, Bedford (England). Aerodynamics Dept.
SOME ASPECTS OF ENGINE AND AIRFRAME INTEGRATION FOR RAMJET AND RAMROCKET POWERED MISSILES
E. L. Goldsmith *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 31 p refs (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

Particular aspects of Ramjet and Ramrocket engine and airframe integration that are explored concern the nature of the flow around a long circular body and the internal performance of single and multiple intakes in this flow. To understand this performance, the performance of isolated intakes at incidence and yaw conditions is reviewed, together with ways that were suggested for improving performance by use of variable geometry. External or airframe aspects of integration, i.e., the measurement of forces and moments on missiles with and without nacelles and the estimation of drag components associated with nacelles are discussed. R.J.F.

N85-15813# United Technologies Corp., San Jose, Calif. Chemical Systems Div.
INTEGRAL BOOST, HEAT PROTECTION, PORT COVERS AND TRANSITION
T. D. Myers *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 20 p refs (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

The Integral Rocket Ramjet (IRR) employs a dual-purpose combustor that serves initially as a rocket combustion chamber for the integral booster and subsequently as a Ramjet combustor. The requirements and basic design approaches for the integral booster motor, heat protection for the integral booster motor, heat protection for the combustor case and nozzle, port cover and transition systems are discussed. These requirements and design approaches for the integral booster motor include the special considerations that must be made for the various types of integral rocket Ramjet propulsion systems that include the liquid fuel Ramjet, solid fuel Ramjet and ducted rocket engines. R.J.F.

N85-15814# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
LIQUID-FUELED RAMJET ENGINES [LES STATOREACTEURS A COMBUSTIBLE LIQUIDE]
Ph. Cazin *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 22 p refs In FRENCH; ENGLISH summary (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

Liquid-fueled Ramjets provide a means of satisfying certain performance requirements in supersonic missile propulsion, such as combining long range with a large flight path flexibility. These power plants thus have a particular application quite distinct from that of Ramrockets or supersonic turbojets - missions requiring major altitude or velocity variations. The high energy efficiency of these engines obtained by specific techniques and technologies are investigated. Liquid fuels (kerosene, very dense liquid fuels, fuels in suspension, etc.); fueling system (advantages and disadvantages of pressure vs. turbopump systems, and tank design); regulation and injection (regulation laws required for different missions and various injector types); combustion chamber (design, general shape, recirculation zones, injector location, thermal insulation, and stresses due to integrated booster); combustion (performance, efficiency, and instability); and test stands (specific characteristics of test stands for liquid-fueled Ramjets) are examined. The possibilities of these engines in various missions, at the main stages of development, and at the future of these techniques are presented. Author

N85-15815# United Technologies Corp., San Jose, Calif. Chemical Systems Div.
SPECIAL PROBLEMS OF RAMJET WITH SOLID FUEL
T. D. Myers *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 9 p (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

The functional simplicity of the solid fuel Ramjet combined with high performance makes this engine type quite attractive for many future tactical missions. Conversely, the complexity of the analysis of the fuel regression behavior, combustion efficiency, and inlet-combustion matching has caused vehicle designers concern over the ability of the solid fuel Ramjet to be able to operate statisfactorily at all the off design conditions required of a tactical missile propulsion system. A large engineering data base was developed for the solid fuel Ramjet over the past 15 years that provides answers to all of the special design problems of the solid fuel Ramjet. This technology base includes over 2500 ground test firings as well as several hundred successful flight tests. This broad technology base provides confirmed solutions to the special design problems of the solid fuel Ramjet. Author

N85-15816# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Unternehmensbereich Apparate.
SOLID PROPELLANT RAMROCKETS
Hans-L. Besser *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 30 p refs (For primary document see N85-15809 07-20)
Avail: NTIS HC A11/MF A01

Design and performance characteristics of the Solid Propellant Ramrocket (SPR) are reviewed. The advanced technical standard that was achieved for this propulsion system allows its application with moderate development expense and relatively law technical risk. While no general design or selection criteria is provided for a missile propulsion system, major advantages were indicated as well as problematic aspects of the SPR system to be considered for propulsion system selection and a rough guide to performance tailoring and component design is presented. B.G.

N85-15817# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
RAMJETS WITH SUPERSONIC COMBUSTION
Frederick S. Billig *In* AGARD Ramjet and Ramrocket Propulsion Systems for Missiles Oct. 1984 29 p refs (For primary document see N85-15809 07-20)

Avail: NTIS HC A11/MF A01

Requirements for high speed-long endurance missiles and the virtues of airbreathing propulsion are presented to support arguments for developing Ramjets that employ supersonic combustion. A review of general classes of inlet configurations leads to the selection of multiple inward turning scoop (ITS) configurations to serve as the basis for engine cycle analysis. A flow model for the combustion process that includes the major features that were observed in experiments serves as the basis for determining the pressure rise in the shock train that precedes combustion and the conditions at the combustor exit. Calculations for simplified frictionless flow with constant specific heats show that: (1) the combustor area ratio is set by the acceleration requirements at the end of boost; (2) the combustor operates in a subsonic mode at low M(sub O) and in a supersonic model at high M(sub O); and (3) optimal performance occurs when the combustion inlet conditions correspond to moderate inlet contraction ratios. B.G.

23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N85-15818 Department of the Air Force, Washington, D.C.
PSEUDO-p-1,2,2,9,9,10,10-OCTOFLUORO (2,2)-p-CYCLOPHANE BIS-ACID CHLORIDE Patent
C. S. Marel, inventor (to Air Force) Issued 9 Oct. 1984 5 p Supersedes AD-D010790
(AD-D011393; US-Patent-4,476,062; US-Patent-Appl-SN-552552; US-Patent-Class-260-544B) Avail: US Patent and Trademark Office CSCL 07/3

Polyaromatic ether-sulfone-ketones containing fluoro-substituted-p-cyclophane units were prepared from isophthaloyl chloride, terephthaloyl chloride, diphenyl ether, diphenoxydiphenyl sulfone and a small amount of either 1,1,2,2,9,9,10,10-octafluoro(2,2)-p-cyclophane (type B) or pseudo-p-1,1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride (type A) by a Friedel-Crafts type polymerization procedure. The p-cyclophane units were incorporated as cross-linking sites. Author (GRA)

N85-15819*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
BIOCATALYZED PROCESSES FOR PRODUCTION OF COMMODITY CHEMICALS: ASSESSMENT OF FUTURE RESEARCH ADVANCES FOR N-BUTANOL PRODUCTION
J. D. Ingham 1 Jul. 1984 28 p refs Sponsored in part by DOE
(Contract NAS7-918)
(NASA-CR-174264; JPL-Publ-84-60; NAS 1.26:174264) Avail: NTIS HC A03/MF A01 CSCL 07A

This report is a summary of assessments by Chem Systems Inc. and a further evaluation of the impacts of research advances on energy efficiency and the potential for future industrial production of acetone-butanol-ethanol (ABE) solvents and other products by biocatalyzed processes. Brief discussions of each of the assessments made by CSI, followed by estimates of minimum projected energy consumption and costs for production of solvents by ABE biocatalyzed processes are included. These assessments and further advances discussed in this report show that substantial decreases in energy consumption and costs are possible on the basis of specific research advances; therefore, it appears that a biocatalyzed process for ABE can be developed that will be competitive with conventional petrochemical processes for production of n-butanol and acetone. (In this work, the ABE process was selected and utilized only as an example for methodology development; other possible bioprocesses for production of commodity chemicals are not intended to be excluded.) It has been estimated that process energy consumption can be decreased by 50%, with a corresponding cost reduction of 15-30% (in comparison with a conventional petrochemical process) by increasing microorganism tolerance to n-butanol and efficient recovery of product solvents from the vapor phase. Author

N85-15820# California Univ., Los Angeles. Dept. of Chemistry and Biochemistry.
STRUCTURAL AND SYNTHETIC ORGANOSILICON CHEMISTRY Final Report, 30 Jun. 1981 - 29 Jun. 1984
M. E. Jung 23 Jul. 1984 16 p
(Grant AF-AFOSR-0185-81)
(AD-A147101; AFOSR-84-0856TR) Avail: NTIS HC A02/MF A01 CSCL 07/3

The use of organosilicon compounds in synthesis is described. In particular the use of trimethylsilyl iodide, silyloxydienes, and vinyl iodides are highlighted. Several structural organosilicon studies are also described. Author (GRA)

24 COMPOSITE MATERIALS

Includes laminates.

N85-15821*# Virginia Polytechnic Inst. and State Univ., Blacksburg.
A STUDY OF THE STRESS WAVE FACTOR TECHNIQUE FOR THE CHARACTERIZATION OF COMPOSITE MATERIALS
Anil K. Govada, J. C. Duke, Jr., E. G. Henneke, II, and W. W. Stinchcomb Jun. 1984 109 p refs
(Grant NsG-3172)
(NASA-CR-174219; NAS 1.26:174219; CCMS-84-13) Avail: NTIS HC A06/MF A01 CSCL 11D

The potential of the stress wave factor as an NDT technique for thin composite laminates was investigated. The conventional SWF and an alternate method for quantifying the SWF were studied. The SWF number was observed to be the highest when measured along the fiber direction and the lowest when measured across the fibers. The alternate method for quantifying the SWF used square root of the zeroth moment of the frequency spectrum of the received signal as a quantitative parameter. When graphite epoxy laminates were cyclically loaded, the square root of the zero moment decreased with the number of cycles. Decreases in the amplitudes of the higher harmonics of the frequency spectrum occurred as a result of transverse matrix cracking in the 90 deg plies of the laminates. The decreases in the square root of the zeroth moment were in agreement with the reduction in laminate stiffness due to cyclic loading. R.S.F.

N85-15822*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A STUDY OF INTERPLY LAYER EFFECTS ON THE FREE-EDGE STRESS FIELD OF ANGLEPLIED LAMINATES
P. L. N. Murthy and C. C. Chamis 1984 31 p refs Presented at the Symp. on Adv. and Trends in Struct. Dyn., Washington, D.C., 22-25 Oct. 1984; sponsored by NASA and George Washington Univ.
(NASA-TM-86924; E-2201; NAS 1.15:86924) Avail: NTIS HC A03/MF A01 CSCL 11D

The general-purpose finite-element program MSC/NASTRAN is used to study the interply layer effects on the free-edge stress field of symmetric angleplied laminates subjected to uniform tensile stress. The free-edge region is modeled as a separate substructure (superelement) which enables easy mesh refinement and provides the flexibility to move the superelement along the edge. The results indicate that the interply layer reduces the stress intensity significantly at the free edge. Another important observation of the study is that the failures observed near free edges of these types of laminates could have been caused by the interlaminar shear stresses. Author

N85-15823*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DESIGN PROCEDURES FOR FIBER COMPOSITE STRUCTURAL COMPONENTS: PANELS SUBJECTED TO COMBINED IN-PLANE LOADS
Christos C. Chamis 1985 29 p refs Presented at the 40th Ann. Conf. of the Society of the Plastics Industry (SPI) Reinforced

Plastics/Composites Inst., Atlanta, 28 Jan. - 1 Feb. 1985
(NASA-TM-86909; 'E-2319; NAS 1.15:86909) Avail: NTIS HC A03/MF A01 CSCL 11D

Step by step procedures are described which can be used to design panels made from fiber composite angleplied laminates and subjected to combined in plane loads. The procedures are set up as a multistep sample design. Steps in the sample design procedure range from selection of the laminate configuration to the subsequent analyses required to check design requirements for: (1) displacement, (2) ply stresses, and (3) buckling. The sample design steps are supplemented with appropriate tabular and graphical data which can be used to expedite the design process.
Author

N85-15824*# Grumman Aerospace Corp., Bethpage, N.Y. Materials and Structural Mechanics Directorate.
THE GROWTH OF METASTABLE PERITECTIC COMPOUNDS Final Report, third year
Ronald G. Pirich Dec. 1984 58 p refs
(Contract NAS8-32998)
(NASA-CR-171289; NAS 1.26:171289; RE-692) Avail: NTIS HC A04/MF A01 CSCL 11D

The effects of directional solidification processing on the microstructural, compositional, and magnetic properties of high-melting-temperature, commercially important alloys which form from the liquid state via peritectic or eutectic type reactions were determined. Emphasis was placed on ferromagnetic compounds of the commercially important Co-Sm and Al-Mn systems. The primary dendrite spacing for eutectic Sm2Co17/Co scaled with negative square root of V and varied from approximately 50 microns for $V > 20$ cm/h to hundreds of microns for $V < 10$ cm/h. Since the crystal growth mechanism was dendritic rather than cooperative, the associated permanent magnet properties were rather poor. Magnetization as a function of sample orientation indicates that the easy axis of magnetization was primarily along the direction of solidification for the eutectic Sm2Co17/Co and peritectic SmCo5/Sm2Co17 compositions. For the Al-Mn case, magnetization and microstructural characterization suggest isotropic, polycrystalling growth for all solidification velocities studied.
R.S.F.

N85-15825*# Grumman Aerospace Corp., Bethpage, N.Y. Materials and Structural Mechanics Directorate.
THE GROWTH OF METASTABLE PERITECTIC COMPOUNDS Final Report, second year
David J. Larson, Jr. Dec. 1984 58 p refs
(Contract NAS8-32998)
(NASA-CR-171290; NAS 1.26:171290; RE-693) Avail: NTIS HC A04/MF A01 CSCL 11D

The influence of gravitationally driven convection on the directional solidification of peritectic alloys was evaluated. The Pb-Bi peritectic was studied as a model solidification system. Analyses of directionally solidified Pb-Bi peritectic samples indicate that appreciable macrosegregation occurs due to thermosolutal convection and/or Soret diffusion. The macrosegregation results in sequantial change of phase and morphology as solidification progresses down the length of the sample. Banding was eliminated when furnace conditions were selected which resulted in a planar solidification interface. The directional solidification that occurs in the vicinity of the Pb-Bi peritectic isothermal was found to be isocompositional and to consist solely of the equilibrium terminal solid solution and peritectic phases on an extremely fine scale. Evidence was found to support the peritectic supercooling mechanism, but not the proposed peritectic superheat mechanism.
R.S.F.

N85-15826*# National Aeronautics and Space Administration, Washington, D. C.
UNIDIRECTIONAL FIBERS AND POLYURETHANE ELASTOMER MATRIX BASED COMPOSITES SYNTHESIS AND PROPERTIES Ph.D. Thesis
A. Chakar Aug. 1984 202 p refs Transl. into ENGLISH of "Composites a Base de Matrice Elastomere Polyurethanne et des Fibres Unidirectionelles, Synthese et Proprietes" rept. IDI-18309 Institut National des Sciences Appliquees, France, 1983 p 1-213 Original language document was announced in IAA as A84-11992 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-77501; NAS 1.15:77501; IDI-18309) Avail: NTIS HC A10/MF A01 CSCL 11D

A study of the properties and manufacturing techniques for long-fiber reinforced elastomeric composites for flexible and damping structural materials is presented. Attention is given to the usage of polyurethane in the matrix to obtain plastic elastomeric matrices and vitreous transition temperatures which vary from -80 C to 10 C, as well as assure good fiber adhesion. Various polyurethane formulations synthesized from diisocyanate prepolymers are examined in terms of mechanical and thermal properties. The principal reinforcing fiber selected is a unidirectional glass cloth.
M.S.K. (IAA)

N85-15827*# Albany International Corp., Dedham, Mass.
FLAME RESISTANT FIBROUS MATERIALS DEVELOPMENT Final Report
Robert J. Coskren Dec. 1982 5 p
(Contract NAS9-13673)
(NASA-CR-167817; NAS 1.26:167817) Avail: NTIS HC A02/MF A01 CSCL 11D

Since 1973, Albany International Research Co. has been engaged by NASA-JSC under Contract No. NAS9-13673 to conduct studies aimed at developing fibers and flexible structures made therefrom which would provide improved flame resistance over existing commercially available materials in oxygen enriched atmospheres. A portion of the crew bay area life support system and crew equipment for the space shuttle was initially designed to function at a 30% oxygen, 70% nitrogen atmosphere at 9 psia pressure. This oxygen concentration imposed certain fire safety and smoke generation requirements which could not be completely met by commonly accepted textiles. Potentially useful new polymers were investigated both for fire safety and mechanical properties. During the course of the work, three candidate fibers were studied and evaluated and the results of each of these efforts are summarized.
R.S.F.

N85-15828# Puerto Rico Univ., Rio Piedras. Dept. of Physics.
OPTICAL PROPERTIES OF COMPOSITE MATERIALS Final Report, 17 Aug. 1981 - 16 Aug. 1984
Z. S. Weisz, M. G. Rodriguez, and J. A. Muir 20 Sep. 1984 10 p
(Grant DAAG29-81-G-0015)
(AD-A146768; ARO-18577.3-MS) Avail: NTIS HC A02/MF A01 CSCL 11/6

In this report we present a study of the optical and electrical properties of hydrogenated silicon-germanium alloys prepared by co-sputtering. The optical absorption coefficient alpha was evaluated both from optical transmission and from photoconductivity measurements. The data derived using the two methods are in good agreement. The values of alpha as a function of photon energy exhibit a shift to lower energies with increasing germanium content, indicating a decreasing band gap. For all the concentrations, the absorption coefficient drops rapidly with decreasing energy, indicating a fairly good structural order and low trap density.
GRA

N85-15829# Texas Univ., Austin. Center for Materials Science and Engineering.
TITANIUM MATRIX/CONTINUOUS FIBER/CONTINUOUS FIBER COMPOSITE INTERFACE INTERACTIONS AND THEIR INFLUENCE ON MECHANICAL PROPERTIES Final Technical Report, 2 Jan. 1980 - 31 May 1984
H. L. Marcus 6 Aug. 1984 178 p
(Grant AF-AFOSR-0052-80)
(AD-A147504; UTCMSE-84-2; AFOSR-84-0812TR) Avail: NTIS HC A09/MF A01 CSCL 11/4

Research on the influence of the interface on the mechanical properties of Ti-6Al-4V metal matrix composites (MMC) containing

Borsic, SiC and B4C/B continuous fibers is reported. The potential high temperature application of the Ti MMC was the basis for thermal fatigue experiments. The mechanical measurements included monotonic and cyclic mixed mode testing. In the testing it is found that the crack follows the matrix/fiber interface for angles from transverse loading up to about 45 deg and propagates normal to the fiber for higher angles and longitudinal loading. This leads to properties that are bimodal in behavior, poor in the first case and higher in the second case. An analysis of diffusion down the interface and into the matrix is described and data presented for both thermal fatigue and isothermal treatments. TEM, EELS and AES results show the interfaces in the Ti MMC to contain very complex chemical, crystallographic and morphological features that are modified by exposure to humidity or a sulfur bearing environment. In addition segregation to the interface and its effect on the cohesive energy was analyzed with a non-equilibrium thermodynamics model. GRA

N85-15830# Starck (Hermann C.) Berlin, Goslar (West Germany).
DEVELOPMENT AND PRODUCTION OF IMPROVED ALPHA-PHASE SILICON NITRIDE POWDERS FOR HOT PRESSING AND SINTERING Final Report, Jun. 1983
Bruno Krismer and Gerd Schwier Bonn Bundesministerium fuer Forschung und Technologie Sep. 1984 34 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-84-208; ISSN-0340-7608) Avail: NTIS HC A03/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 7

High-purity fine alpha-Si3N4-powders for pressureless sintering, hot pressing, and hot isostatic pressing were developed. The nitridation of silicon powders was used for manufacturing alpha-Si3N4. The powder fineneşs required is achieved by milling, high powder purity is achieved by chemical treatment. The finer alpha-Si3N4-powders are characterized by uniform grain shape, uniform grain size distribution, and high apparent density. They offer favorable conditions to achieve high grain densities, a fine microstructure, and the possibility to work with relatively low amounts of sinter aids. Author (ESA)

N85-15831# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
IMPRESSIONS FROM A STUDY TOUR IN FINLAND CONCERNING FIBER REINFORCED PLASTICS, JUNE 1984
Fritz Larsson Sep. 1984 11 p refs In SWEDISH; ENGLISH summary
(FOA-C-20552-D2(E4,F9); ISSN-0347-3694) Avail: NTIS HC A02/MF A01

The use of fiber reinforced plastics in high performance applications is outlined, including light plastic structures for aeronautical wings, sandwich structures, autoclaves and quenching ovens, and thermoplastic resins. Carbon and glass fibers, pultrusion combined with filament winding, ductility determination for plastic structures, and corrosion resistance are also discussed.
Author (ESA)

N85-15931# Joint Publications Research Service, Arlington, Va.
ALL-COMPOSITE AIRBUS EMPENNAGE Abstract Only
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 4 Transl. into ENGLISH from Composites et Nouveaux Mater. (Paris), Sep. 1984 p 6 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

25 INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also *77 Thermodynamics and Statistical Physics.*

N85-15832 British Library Lending Div., Boston Spa (England).
INFLUENCE OF TEMPERATURES OF REACTANTS ON NATURE OF PRODUCT OF SOLID-PHASE REACTIONS
D. A. Aznabaev, E. F. Vegman, and A. N. Pyrikov [1984] 4 p Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chem. Met. (USSR), no. 5, 1984 p 144-145
(BLL-M-36019-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

Chemically pure substances were used in laboratory tests to study features of solid-phase interactions. The influence of the level of preliminary heating of reactants on the nature of the product of solid-phase reactions was determined. Author

N85-15833 Department of the Air Force, Washington, D.C.
GAS CONTAMINATION DETECTION DEVICE Patent
E. S. Kolesar, Jr., inventor (to Air Force) Issued 18 Sep. 1984 7 p Supersedes AD-D009334
(AD-D011386; US-Patent-4,472,356; US-Patent-Appl-SN-343136; US-Patent-Class-422-88) Avail: US Patent and Trademark Office CSCL 15/2

A device is described for detecting the degree of contaminating of a gas filter system by a contaminating gas. The device comprises a filter chamber having a pair of rids positioned therewithin and coated with a semiconductive polymer whole bulk conductivity changes due to a chemical reaction between the polymer and a contaminating gas. Measurement of the change is then utilized to indicate the degree of contamination in the filter system. GRA

N85-15834*# National Aeronautics and Space Administration, Washington, D. C.
REACTIONS OF BUTADIYNE. 1: THE REACTION WITH HYDROGEN ATOMS
W. Schwanebeck and W. Warnatz Dec. 1984 19 p refs Transl. into ENGLISH from Ber. der Bungsenges. fuer Phys. Chem. (West Germany), v. 79, 1975 p 530-535 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-4005)
(NASA-TM-77805; NAS 1.15:77805) Avail: NTIS HC A02/MF A01 CSCL 07D

The reaction of hydrogen (H) atoms with butadiene (C4H2) was studied at room temperature in a pressure range between w mbar and 10 mbar. The primary step was an addition of H to C4H2 which is in its high pressure range at p 1 mbar. Under these conditions the following addition of a second H atom lies in the transition region between low and high pressure range. Vibrationally excited C4H4 can be deactivated to form buten-(1)-yne-(3)(C4H4) or decomposes into two C2H2 molecules. The rate constant at room temperature for primary step is given. The second order rate constant for the consumption of buten-(1)-yne-(3) is an H atom excess at room temperature is given. Author

N85-15835*# National Aeronautics and Space Administration, Washington, D. C.
THE ANODE MECHANISM OF A THERMAL ARGON ARC
G. Busz-Peuckert and W. Finkelnburg Dec. 1984 14 p refs Transl. into ENGLISH from Z. fuer Phys. (West Germany), v. 144, 1956 p 244-251 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-4004)
(NASA-TM-77754; NAS 1.15:77754) Avail: NTIS HC A02/MF A01 CSCL 21B

In order to clarify the anode mechanism in freely burning argon arcs, the anode drop was determined by probe measurements in the current intensity range of 10 to 200 A and arc lengths between 2 and 10 mm. Simultaneously, the power input at the anode was determined by measuring the temperature increase in the cooling water, using a thermoelement, and compared to the electrical output at the arc and in the anodic drop area. An anodic contraction was observed in the arc, at low current intensities. The results can be explained in terms of the effects of a cathodic plasma current, and in the contracted arc, in terms of an additional anodic plasma current. R.S.F.

N85-15836*# National Aeronautics and Space Administration, Washington, D. C.
STUDY OF THE LIQUID VAPOR EQUILIBRIUM IN THE BROMINE-HYDROBROMIC ACID-WATER SYSTEM
R. Benizri, P. Lessart, and P. Courvoisier Dec. 1984 17 p refs Transl. into ENGLISH of "Etude de l'equilibre de phases liquides-gaz dans le system brome-acide bromhydrique-eau" rept. EUR-6783, 1980 p 101-116 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-4004)
(NASA-TM-77787; NAS 1.15:77787) Avail: NTIS HC A02/MF A01 CSCL 07D

A glass ebullioscope was built and at atmospheric pressure, liquid-vapor equilibria relative to the Br2-HBr-H2O system, in the concentration range of interest for evaluation of the Mark 13 cycle was studied. Measurements were performed for the brome-azeotrope (HBr-H2O) pseudo-binary system and for the ternary system at temperatures lower than 125 C and in the bromine concentration range up to 13% wt. Author

N85-15837*# National Aeronautics and Space Administration, Washington, D. C.
THE DISCHARGE MECHANISM OF THE HIGH-TEMPERATURE ARC
G. Busz-Peuckert and W. Finkelnburg Jan. 1984 13 p refs Transl. into ENGLISH from Z. fuer Phys. (West Germany), v. 146, 1956 p 655-663 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-4005)
(NASA-TM-77794; NAS 1.15:77794) Avail: NTIS HC A02/MF A01 CSCL 21B

The mechanism of the high temperature Ar arc is interpreted considering those essential points in which it deviates from the known arcs based on earlier measurements and experiments. The following points are discussed individually: the charge carrier balance, the energy balance, the volt amp characteristics, and the difference between high temperature arcs in Ar and N. Besides the volt amp characteristic of a 10 mm long arc in Ar between 10 and 200 amp, the anode fall, cathode fall, and arc gradient were obtained with the aid of probes. The difference between Ar and N arcs are attributed to variations of the heat conditions and electrical conditions at different temperatures of the gas. Author

N85-15838# Washington State Univ., Pullman. Dept. of Physics.
MEASUREMENT OF SOFT X-RAY ABSORPTION SPECTRA WITH A FLUORESCENT ION CHAMBER DETECTOR
F. W. Lytle, R. B. Greegor, D. R. Sandstrom, E. C. Marques, and J. Wong 23 May 1984 26 p
(Contract N00014-82-K-0530)
(AD-A142213; TR-4) Avail: NTIS HC A03/MF A01 CSCL 07/4

Absorption spectra at the K-edges of S, Cl, Ar, and K have been measured in fluorescence mode on the hard X-ray beam lines at SSRL using an ion chamber detector collecting 20% of 2 pi. In spite of diminished X-ray flux and fluorescent yield, sufficient sensitivity was obtained to characterize one percent S in coal. On an unfocused wiggler beam line a resolution of 0.5 eV was obtained at the S K-edge. Author (GRA)

N85-15839# Department of the Navy, Washington, D. C.
APPARATUS FOR DETERMINING THE LIQUID WATER CONTENT OF A GAS Patent Application
H. E. Gerber and B. G. Ulfers, inventors (to Navy) Filed 18 Apr. 1984 19 p
(AD-D011297; US-Patent-Appl-SN-601516) Avail: NTIS HC A02/MF A01 CSCL 14/2

An apparatus for determining the liquid water content (LWC) of a sample gas having water droplets suspended therein includes a light source for passing a collimated light beam through the sample gas, and a sensor for detecting the light scattered by the water droplets. The sensor includes a photodetector having a planar light sensitive surface positioned to receive scattered light. A light trap is also provided between the photodetector and the light source for blocking nonscattered light in the light beam from the photodetector. The light flux detected by the photodetector is proportional to LWC. Author (GRA)

N85-15840# Indiana Univ., Bloomington. Dept. of Physics.
VIBRATIONAL SPECTROSCOPY OF CHEMISORPTION PHENOMENA ON MODEL CATALYST SURFACES Annual Report
L. L. Kesmodel 10 Oct. 1984 6 p
(Contract N00014-80-C-0147; DA Proj. RR0-1102)
(AD-A146753; AR-1) Avail: NTIS HC A02/MF A01 CSCL 07/4

Annual summary report is presented on experimental investigation of molecular interactions on model catalyst surfaces using high-resolution electron energy loss spectroscopy (EELS). Data on acetylene and benzene adsorption on palladium surfaces is described. GRA

N85-15841# AeroChem Research Labs., Inc., Princeton, N. J.
MECHANISM OF SOOT FORMATION Final Report, 9 Apr. 1984 - 8 Apr. 1985
D. B. Olson, D. G. Keil, and H. F. Calcote Sep. 1984 21 p
(Contract DAAG29-84-M-0292)
(AD-A146817; AEROCHEM-TP-445; ARO-21395.1-EG-CF) Avail: NTIS HC A02/MF A01 CSCL 21/2

Soot formation in pyrolysis and combustion involves complex reaction systems with many species and individual reactions. It also involves the transition of a gaseous chemical system into a particle-containing (i.e., two-phase) system. Thus, there are various stages of the soot formation process on which to concentrate research investigations. These are generally accepted to be: (1) Precursor formation - gas phase chemistry; (2) Chemical nucleation - particle inception; (3) Growth; (4) Agglomeration, coagulation, and aggregation; and (5) Oxidation - competitive with each of the above. The soot workshop topics were organized along the lines of the above list, with the significant addition of another category entitled Global Mechanisms and Mechanistic Limitations, which was the catch-all area. GRA

N85-15842# Texas A&M Univ., College Station. Dept. of Chemistry.
CATALYTIC OXIDATION BY TRANSITION METAL IONS IN ZEOLITES Final Report, 1 Jun. 1981 - 31 May 1984
J. H. Lunsford 28 Sep. 1984 9 p
(Contract DAAG29-81-K-0096)
(AD-A146828; ARO-18005.4-CH) Avail: NTIS HC A02/MF A01 CSCL 07/4

The regular cavities within zeolite form a unique environment for carrying out both stoichiometric and catalytic oxidation reactions. Transition metal ions such as molybdenum and cobalt may be introduced into zeolites, where they form complexes with oxidants and substrate ligands. The objectives of the research were: (1) to understand oxidation reactions in zeolites at a molecular level, and (2) to evaluate the potential of zeolites as catalysts in selective oxidation reactions. GRA

N85-15843# National Bureau of Standards, Gaithersburg, Md. Quantum Chemistry Group.
APPLICATION OF QUANTUM CHEMISTRY OF ATMOSPHERIC CHEMISTRY Annual Report, 1 Oct. 1983 - 30 Sep. 1984
M. Krauss and W. J. Stevens 30 Sep. 1984 15 p
(Grant AF-AFOSR-ISSA-83-00008)
(AD-A147035; AFOSR-84-0860TR) Avail: NTIS HC A02/MF A01 CSCL 20/10

Relativistic effective potentials have been generated for a number of relevant metals such as iron, neodymium, and uranium and applied to calculations of the oxide electronic states including intermediate coupling calculations of the spin-orbit interaction. Author (GRA)

N85-15844# Case Western Reserve Univ., Cleveland, Ohio. Dept. of Chemistry.
ELECTRONIC AND REDOX PROPERTIES OF STACKED-RING SILICON PHTHALOCYANINES FROM MOLECULAR ORBITAL THEORY

A. B. Anderson, T. L. Gordon, and M. E. Keney 19 Oct. 1984 28 p
(Contract N00014-75-C-0693)
(AD-A147161; CWRU/DC/TR15) Avail: NTIS HC A03/MF A01 CSCL 07/4

It is shown that the multi-peaked cyclic voltammograms for silicon phthalocyanine monomer-oligomer sets may be predicted from initial state molecular orbital energy levels if field shifts are used to allow for the charges of the anions and cations. The theory should have broad application for the understanding of the redox properties of other cofacial macrocyclic ring systems and the conductivity of doped cofacial polymers. The molecular orbital energy levels also produce the features of the optical and photoemission spectra of silicon phthalocyanine monomer-oligomer sets in the HOMO-LUMO energy regions, showing the importance of direct pi overlap. GRA

N85-15845# Department of the Army, Washington, D. C.
HIGH CAPACITY INORGANIC OXYHALIDE ELECTROCHEMICAL CELL Patent Application
C. W. Walker, Jr., W. L. Wade, Jr., M. Binder, and S. Gilman, inventors (to Army) Filed 21 Sep. 1984 7 p
(AD-D011321; US-Patent-Appl-SN-653116) Avail: NTIS HC A02/MF A01 CSCL 09/1

A high capacity lithium inorganic oxyhalide electrochemical cell is provided including lithium as the anode, carbon as the cathode, and a solution of a quaternary ammonium salt in an inorganic oxyhalide solvent as the electrolyte. Author (GRA)

N85-15846# Oklahoma State Univ., Stillwater. Dept. of Chemistry.
A STUDY OF THE CHEMICAL INTERACTION OF GASES WITH ACTIVATED CARBON Final Report, 1 Jun. 1981 - 30 Aug. 1984
M. G. Rockley 22 Oct. 1984 7 p
(Contract DAAG29-81-K-0098)
(AD-A147342; ARO-17911.3-CH) Avail: NTIS HC A02/MF A01 CSCL 07/4

This project was initiated to apply the newly developed technique of Fourier Transform Infrared Photoacoustics to the study of activated carbon in the presence of various sorbate gases. The FTIR-PAS measurement is sensitive to reflectivity due to large extinction coefficients. It is also quite sensitive, especially in the spectral overtones region, to particle size when the particle size is less than 50 microns n diameter. FITR-PAS is capable of less than 0.1% precision of measurement and has been shown to be quantitative at least for internally calibrated samples of reproducible mesh. FTIR-PAS spectra do not match normal absorbance spectra. Residual absorption from scattering from the particles in solid state samples shows itself as a broad underlying background signal. There is no commercially available standard carbon black. For the study of adsorption of sample gases much shallower sampling depths than available for this work must be used. The standard hexane-soot prepared for these studies was found to undergo chemical relaxation under normal atmospheric conditions over a period of 48 hours, after which it was observed to be chemically stable. GRA

N85-15847# Chicago Univ., Ill. James Franck Inst.
THE ADSORPTION OF CO AND OXYGEN ON Cu LAYERS ON A W(110) SURFACE
I. M. Hamadeh and R. Gomer 25 Sep. 1985 42 p
(Contract N00014-77-C-0018; RR0-1102)
(AD-A147345) Avail: NTIS HC A03/MF A01 CSCL 07/4

The adsorption of CO, and to a lesser extent that of oxygen on Cu layers deposited on a W(110) surface has been investigated by thermal desorption, Auger, and XPS measurements. For CO the amount adsorbed decreases monotonically with Cu thickness from 1-5 layers. For 0 there is a slight increase for 1 layer, followed by a steep decrease up to 4 Cu layers where the amount adsorbed levels off. CO adsorption shifts the core levels of Cu (observed for 1 layer of Cu) to higher binding energy by 0.4 eV; the 0 ls level of CO is also shifted to higher binding energy by 1.5 eV relative to CO/W(110), suggesting that electron transfer from CO occurs but is passed on the underlying W. For 0 adsorption there is very little shift in the Cu core levels or in the 0 ls level, relative to 0/W(110). Thermal desorption of CO at saturation coverage Cu1/W(110) shows desorption peaks at 195, 227, and 266 K, as well as small peaks associated with CO desorption from clean W, namely a peak at 363 K and beta-desorption peaks at 1080 and 1180 K. As CO coverage is decreased the 195 and 227 K peaks disappear successively; the W-like peaks remain unchanged in intensity. It is argued that the latter may be due to adsorption on bare W at domain boundaries of the Cu overlayer, while the 190-266 K peaks are associated with adsorption on Cu, but probably involve reconstruction of the Cu layer. The effect of tungsten electronic structure on the behavior of adsorbates on the Cu overlayers, as well as similar effects in other sandwich systems are discussed. GRA

N85-15848# New Hampshire Univ., Durham. Dept. of Physics.
LASER SPECTROSCOPY OF ALKALI ATOM-TETRAHALOETHYLENE REACTIONS Final Report, Jun. 1982 - Dec. 1983
J. W. Wright Kirtland AFB, N. Mex. AFWL Aug. 1984 22 p
(Contract F29601-82-K-0068)
(AD-A147431; AFWL-TR-83-132) Avail: NTIS HC A02/MF A01 CSCL 07/2

The results of a series of experiments are reported to determine the origin of the chemiluminescent spectrum observed in reactions of alkali metal atom swith vapors of C2C14 and similar halogenated C2 molecules. The emission was observed to be independent of the alkali atom and the halogen atom and, hence, attributed to a previously unobserved state of a carbon molecule, such as C2, C3, or C4. Null results from laser spectroscopy suggest the emission is not to the ground state of the molecule. Initial gain measurements were also negative. These reactions are being investigated using mass spectroscopy with the aim of determining the source of the chemiluminescence and the molecular dynamics of this and related reactions. During the course of this research, several other chemiluminescent reactions were discovered which are also promising candidates for future investigation. The primary result from this research is that the stripping of halogen atoms from parent molecules by alkali atoms is an exothermic process capable of producing electronically excited atoms and molecules and has apparently received little attention in the past.
Author (GRA)

N85-15849# Air Force Rocket Propulsion Lab., Edwards AFB, Calif.
AN OPTICAL AND MASS SPECTROMETRIC STUDY OF THE ALUMINUM-OXYGEN FLAME Final Report, 2 Dec. 1977 - 30 Aug. 1981
D. P. Weaver and D. M. Mann Aug. 1984 32 p
(AF Proj. 2308)
(AD-A147434; AFRPL-TR-84-053) Avail: NTIS HC A03/MF A01 CSCL 21/2

Aluminum oxide particulates are major contributors to aluminized propellant solid rocket stability and two-phase performance losses and are also chief contributors to the visible and infrared exhaust signatures. These particulates result from the combustion of elemental aluminum. The formation mechanisms of such particles in a controlled laboratory environment are being investigated. A high temperature flow reactor was used in a series of experiments to look at overall rates and identify global mechanisms. Identification of the major aluminum oxide species was made mass spectroscopically, while initial particle formation was inferred from the UV/visible spectra. Identification of AlnOm species with O less than n, m less than or = 2 has been made. A mass peak at 102 Atomic Mass Units (AMU) was ascribed to the previously unobserved gas phase Al2O3 molecule. The UV/visible spectra from Al(+)O2 flame zone are dominated by a continuum. This emission was attributed to incandescence of newly nucleated alumina particles. The effective temperatures (T sub p) of these particles was found to lie in the range 1960. 2250 deg K (ambient gas temperature is 800 deg K). This temperature has been shown

to be consistent with the heat flux produced by condensing Al2O3 species. Rates for the bi-molecular reactions leading to Al2O3 have been inferred from the data. Following nucleation and growth to approximately 10 nm diameter, alumina particulates are observed to grow by agglomeration into 0.3-m clusters. GRA

N85-15850# Vermont Univ., Burlington. Dept. of Chemistry.
(VINYLOXY)FLUOROCYCLOTRIPHOSPHAZENES
C. W. Allen and R. P. Bright 25 Oct. 1984 16 p Submitted for publication
(Contract N00014-77-C-0605; NR Proj. 356-663)
(AD-A147448; TR-15) Avail: NTIS HC A02/MF A01 CSCL 07/3

The reactions of the lithium enolate of acetaldehyde, LiOC-HCH2, with hexafluorocyclotriphosphazene, N3P3F6, lead to the series of (vinyloxy)fluorocyclotriphosphazene, N3P3F6-n (OC-H=CH2)n (n=2-5). The 1H NMR data shows that throughout the entire series, the substituent is bound through the oxygen end of the ambidentate enolate. The reaction shows a reluctance to go past the trisubstituted stage and the fluorine atom in N3P3F (OCH=CH2)5 cannot be removed even under forcing conditions. Evidence from the 31H, 19F and 31P NMR spectra shows that a non-geminal pathway is exclusively followed. Differences in the reaction patterns with enolate anions followed by N3P3F6 and N3P3Cl6 are discussed. GRA

N85-15851# Harvey Labs., Inc., Charlottesville, Va.
QUALITATIVE AND QUANTITATIVE COMPOSITIONAL ANALYSIS OF SHALE DERIVED BY GAS CHROMATOGRAPHY AND COMBINED GAS CHROMATOGRAPHY/MASS SPECTROMETRY. EXECUTIVE SUMMARY
T. M. Harvey and B. L. Wallace 1984 37 p
(Contract N00167-81-R-0278)
(AD-A148369) Avail: NTIS HC A03/MF A01 CSCL 08/7

As part of its program to insure uninterrupted supplies of diesel marine fuel, The Navy Alternate Fuels Program evaluates the performance characteristics as well as the chemical and physical characteristics of synfuels. Incumbent in this series of evaluations is the need for qualitative and quantitative compositional data for both liquid conventional and synthetic DFM's and their more volatile or headspace components. The objectives of this work were several. (1) Determine the qualitative and quantitative composition of the headspace volatiles at various temperatures for this shale derived DFM. (2) Relate these data to the bulk liquid fuel composition. (3) Evaluate the bulk liquid and headspace components for potential toxicological problems as related to exposure of Navy personnel. (4) Extract from methodology used and developed in this program, a reliable, inexpensive, and representative acceptance protocol with which to evaluate individual lots of conventional DFM and synfuel DFM for volatiles. GRA

N85-15852# Oxford Univ. (England). Inorganic Chemistry Lab.
SYNTHESIS AND PROPERTIES OF HEXACHLOROMOLYBDATES(5) AND RELATED SPECIES Final Scientific Report, 1 Jan. 1981 - 31 Oct. 1983
K. R. Seddon 4 Nov. 1983 119 p
(Grant AF-AFOSR-0064-81; AF Proj. 2301)
(AD-A139599; EOARD-TR-84-10) Avail: NTIS HC A06/MF A01 CSCL 07/4

The general objective of this research program was to prepare complexes of the general type A(MoCl6) (A = monopositive cation), for use as cathode materials in chemical batteries with the specific aim of developing techniques for large scale preparation of the lithium and sodium salts. The various complexes were studied by a wide range of spectrochemical and electrochemical techniques such as epi, IR, Raman and solution electronic absorption spectroscopy and cyclic voltametry. The work and results have been closely evaluated with personnel at the USAF FJ Seiler Research Laboratories. GRA

N85-15853# Royal Netherlands Meteorological Inst., De Bilt. Fysisch Meteorologisch Afdeling.
THE INFLUENCE OF SAMPLE COLLECTION AND METHODS OF ANALYSIS ON CHEMICAL CONCENTRATIONS MEASURED IN RAINWATER
T. B. Ridder, J. H. Baard (ECN), and T. A. Buishand 1984 47 p refs In DUTCH; ENGLISH summary
(KNMI-TR-55; B8473609) Avail: NTIS HC A03/MF A01

Rainwater collectors of different types were installed to study the effect of sampling methods on measured concentrations. When the sampling bottles are not protected against daylight, chemical reactions take place resulting in a decrease of NH4-ions and an increance of H-ions. Considerable differences are also found between K-concentrations in a light sensitive collector and a collector protected against daylight. There is hardly any difference in concentration between monthly samples and monthly averages of weekly samples for collectors protected against light. Large differences in average concentrations can occur between different types of wet-only collectors. The differences in concentrations between bulk and wet-only collectors are on the average 10% to 40%. For H-ions, however, concentrations in wet-only collectors are larger than the concentrations in bulk collectors. Systematic differences between laboratories are found for the components H, NH4, K, Mg, Cl, and NO3. Author (ESA)

26 METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N85-15854# British Library Lending Div., Boston Spa (England).
INFLUENCE OF SIZE GRADING OF SINTERING ORE ON THE SINTERING PROCESS
A. I. Isteev, O. P. Lukasheva, A. I. Naidenov, and I. F. Kurunov 7 Dec. 1984 6 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chernaya Met. (USSR), no. 5, 1984 p 19-21
(BLL-M-36004-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

Theoretical calculations and laboratory experiments on sintering of mixes with different proportions of + 3 and - 3 fractions in the sintering ore were carried out. It was found that the optimum content of - 3 mm fraction, 40 to 42%, gives maximum strength of mix granules because of dense packing. The vertical sintering speed and sinter strength then increase. Author

N85-15855 British Library Lending Div., Boston Spa (England).
THE FORMATION OF ISOLATED PHASE PRECIPITATES DURING THE DECOMPOSITION OF HIGH-COERCIVE FORCE Fe-Cr-Co ALLOYS
I. S. Belyatskaya 3 Dec. 1984 5 p ref Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved., Chernaya Met. (USSR), no. 5, 1984 p 152-153
(BLL-M-36028-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

Electron microscopy analysis was carried out on a Fe(23%)Cr (15%)Co(3%)Mo alloy given diffent heat and thermomagnetic treatments. The precipitates found are described. Conclusions are drawn regarding the effects of varying the thermomagnetic treatment temperature. Author

N85-15856 British Library Lending Div., Boston Spa (England).
SPECIAL FEATURES OF THE DEFORMATION OF MOLYBDENUM AT HIGH TEMPERATURES
N. M. Vavilkin, V. A. Popov, and V. S. Yusupov 3 Dec. 1984 4 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Chernaya Met. (USSR), no. 5, 1984 p 151-152
(BLL-M-36027-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

A preferable temperature of 1300 C was determined for mclybdenum on the basis of examining fractured specimen surfaces under the electron microscopy. Flat test pieces were tested at 20 to 1600 C in a vacuum and polished before examination. The test pieces were fractured in every case. Up to 1300 C there were no intergranular cracks, but Chernov lines were found. At

1300 to 1400 C both slip lines and intergranular cracks were found on surfaces. At 1400 to 1600 C no slip bands were found at the surfaces, but the grains were displaced relative to one another. R.J.F.

N85-15857 United Kingdom Atomic Energy Authority, Risley (England).
CORROSION STUDY ON ZIRCONIUM REFRACTORY COATINGS. 1: OXIDATION OF ZIRCONIUM NITRIDE COATINGS BY OXYGEN
M. Caillet, H. F. Ayedi, and J. Besson 13 Dec. 1984 20 p refs Transl. into ENGLISH from J. Less Common Metals (Switzerland), v. 51, 1977 p 305-322
(BLL-Risley-Tr-5044-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

The kinetic aspects of the oxidation of zirconium nitride coatings were studied between 550 and 700 C and for pressures within the range 50 to 500 Torr. The general shape of the kinetic curves changes with temperature exhibiting up to about 650 C an upward concavity in their initial stage, followed by an approximately linear stage. At the lowest temperatures a decrease in the weight of the sample was observed at the beginning of the reaction. The oxygen pressure has an influence on the maximum weight loss and on the reaction rate during the linear stage. The proposed mechanism involves the formation of zirconium-oxygen solid solutions preceding that of zirconium. Author

N85-15858 United Kingdom Atomic Energy Authority, Risley (England).
DEPOSITION OF TITANIUM NITRIDE COATINGS BY REACTIVE EVAPORATION AND ELECTRICALLY ACTIVATED REACTIVE EVAPORATION
J. Granier and J. Besson 17 Aug. 1984 10 p Transl. into ENGLISH from High Temp. - High Pressures (England), v. 10, 1978 p 179-185
(BLL-Trans-5043-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

The reactive evaporation of titanium nitride coatings with an electron beam: gun reactive evaporation with or without electrical discharge in the reactive gas is described. The effect of the deposition temperature (300 to 500 C), pressure (0.25 to 5.0 m torr), discharge (0 and 2.0A) and gun power (2.5 to 5.0 kW) on some of the properties of the deposited layer (morphology, crystal structure, chemical composition, density and hardness) was studied. The activated reactive evaporation process is characterized by a relatively high deposition rate and a low substrate temperature, enabling wear-resistant titanium nitride coatings to be deposited on a wide variety of substrates. Author

N85-15859 Rolls-Royce Ltd., London (England).
STUDY OF RESIDUAL STRESSES INTRODUCED INTO TA6ZrD (685) CYLINDERS BY QUENCHING
S. Denis 14 Nov. 1984 23 p refs Transl. into ENGLISH of French document
(BLL-PNR-90240-(8019.3153)) Avail: British Library Lending Div., Boston Spa, Engl.

The alloy TA6ZrD is one of the titanium alloys which is creep resistant in the temperature range 400 to 550 C used for compressor discs in some gas turbine engines for the aircraft industry. In order to obtain the structure with the best useful properties, TA6ZrD is quenched after soaking at 1050 C to produce the beta phase. The rapid cooling has the disadvantage of introducing into treated components residual stresses which might affect their application properties and working properties, especially their low cycle fatigue strength. The conditions under which these stresses are formed and the factors which initiate them must be determined in order to modify the heat treatment conditions for the alloy and so reduce the level of residual stresses. The thermal and mechanical behavior of the alloy was investigated and inserted into an elastic plastic deformation and stress calculation model. Author

N85-15860 United Kingdom Atomic Energy Authority, Risley (England).
AUSTENITIC STAINLESS STEEL FOR HIGH TEMPERATURE AND PRESSURE APPLICATIONS
5 Jul. 1984 14 p Transl. into ENGLISH of rept. Sandvik-12R72 Sandvik, Sweden, Oct. 1978
(BLL-Risley-Tr-4527-(9091.9F); Sandvik-12R72) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

The mechanical properties of SANDVIK 12R72, an austenitic stainless steel, are discussed. The forms in which the steel is supplied, corrosion resistance, bending, weldability, and typical applications are also discussed. R.J.F.

N85-15861 United Kingdom Atomic Energy Authority, Risley (England).
TESTING OF NON-ALLOYED AND LOW-ALLOYED STEELS FOR THEIR BEHAVIOUR WITH RESPECT TO INTERCRYSTALLINE STRESS CORROSION CRACKING
5 Jul. 1984 4 p Transl. into ENGLISH from Stahl-Eisen Pruefblatt (West Germany), v. 1860-61, issue 2, May 1961
(BLL-Risley-Tr-4546-(9091-9F)) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

The testing of low-alloyed steels for their behavior with respect to intercrystalline stress corrosion cracking is discussed. The test is a short process, where specimens which were locally cold-formed and elastically put under tension are boiled in a calcium nitrate solution and examined for cracks. If cracks exist at the end of the test, or if they occur before the prescribed test duration time expires, the specimen is not considered to be resistant to stress corrosion cracking. R.J.F.

N85-15862 British Gas Corp., London (England).
STRENGTH AND AGING BEHAVIOUR OF SOFT SOLDERED JOINTS Ph.D. Thesis
D. G. Kassel 26 Sep. 1984 8 p Transl. into ENGLISH from thesis Technische Univ., Berlin, 1969
(BLL-T6385/BG/WH800/84) Avail: British Library Lending Div., Boston Spa, Engl.

The strength and aging behavior of soft soldered joints are discussed. Binary and ternary systems, metallographical and strength tests, copper solubility during soldering, and the results of hardness testing of intermetallic joints are examined. R.J.F.

N85-15863 British Library Lending Div., Boston Spa (England).
THIO AND SELENO COMPOUNDS OF THE TRANSITION METALS WITH THE d (o) CONFIGURATION
E. Diemann and A. Mueller 10 Sep. 1984 46 p refs Transl. into ENGLISH from Coord. Chem. Rev. (West Germany), v. 10, 1973 p 79-122
(BLL-Mintek-Tr-1177-(5810.5759)) Avail: British Library Lending Div., Boston Spa, Engl.

Thermal decomposition, analytical applications, industrial significance, X-ray studies, electronic spectra and MO calculations; vibrational spectra and force constants; and chemical bonding of thio and seleno compounds and their derivatives were investigated. B.G.

N85-15864 British Library Lending Div., Boston Spa (England).
MICROBIOLOGICAL METHOD FOR THE DESILICONIZATION OF HIGH-SILICA BAUXITES
P. I. Andreev and S. I. Kikirikilitsa 10 Sep. 1984 4 p Transl. into ENGLISH from Tsvetnye Met. (USSR), no. 8, 1980 p 101-103
(BLL-Mintek-TR-1168-(5810.5759)) Avail: British Library Lending Div., Boston Spa, Engl.

A promising method for the concentration of high-silica bauxites, is represented by a microbiological approach which employs soil bacteria capable of attacking the silicate and aluminosilicate minerals and transferring them into solution. This approach produces high processability indexes and there is no danger of environmental pollution. The studies of microbiological desiliconization were conducted with the use of a sample of kaolinite-gibbsite

bauxites from one of the deposits in Kazakhstan. The content of main components and minerals in this sample is presented. R.J.F.

N85-15865 British Gas Corp., London (England).
INVESTIGATION OF THE CREEP BEHAVIOUR OF SOFT SOLDERED JOINTS WITH SOLDER L-SnAg5 AT AMBIENT TEMPERATURE
T. Nesse, H. Koch, and E. Macherauch 26 Sep. 1984 21 p refs Transl. into ENGLISH from Schweissen Schneiden (West Germany), v. 23, no. 2, 1971 p 47-51 In ENGLISH and GERMAN
(BLL-T6383/BG/WH798/84) Avail: British Library Lending Div., Boston Spa, Engl.

The creep strength at ambient temperatures of soldered joints using base metals of both high and low thermal conductivity is examined. The results are doubtless only transferable to a limited extent to other soldered joints under different test conditions. B.G.

N85-15866 British Library Lending Div., Boston Spa (England).
INFLUENCE OF PRESSURE ON COMPACTION DURING COMPRESSION OF POWDERS OF IRON AND 40Kh AND 10R6MS STEELS
S. I. Stepanov and A. M. Tamarina 1984 6 p refs Transl. into ENGLISH from Stal (USSR), no. 5, 1984 p 71-72
(BLL-M-35995-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

The influence of the pressure of compression on compaction of powders of iron and steel 40Kh and 10R6M5 was investigated. Compression was conducted in the cold state with one-sided application of the load. The fibrous, mixed, and crystalline nature of the fracture of compressed articles was studied. The influence of carbide-forming alloying elements on dislocations was determined. Author

N85-15867 British Library Lending Div., Boston Spa (England).
INTERACTION BETWEEN CHROMIUM OXIDE AND CARBON
S. M. Golodov, V. A. Kolchanov, G. K. Tarabrin, and S. B. Sorin 1984 7 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chern. Met. (USSR), no. 5, 1984 p 6-9
(BLL-M-36002-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

The kinetics of carbon reduction of chromium oxide during linear heating with subsequent isothermal holding in order to produce higher chromium carbide was studied. Reduction was conduted on a thermographic unit in different gas atmospheres and in vacuum. Waste gas products were studied on a chromatograph. Reduction of chemically pure chromium oxide reground with different solid-phase reducing agents and also technical-grade chromium oxide with a syrup binder was investigated. Results indicate that the temperature of the start of reduction of chromium oxide is practically independent of the type of carbonaceous material. Author

N85-15868 British Library Lending Div., Boston Spa (England).
PROCEDURE FOR INVESTIGATING HIGH-TEMPERATURE PROPERTIES OF IRON-ORE MATERIALS
V. Kh. Katsman, V. A. Emelyanov, and V. I. Shatokha 1984 4 p Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chern. Met. (USSR), no. 5, 1984 p 145
(BLL-M-36020-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

The behavior of sinter and pellets during melting was examined. The procedure makes it possible to record the outflow temperature of liquid products and to determine shrinkage of materials and losses of gas permeability of the bed. It can be used for investigating the high-temperature properties of iron-ore materials used in the blast-furnace process. Author

N85-15869 British Library Lending Div., Boston Spa (England).
THE DETERMINATION OF VERTICAL SINTERING SPEED OF SINTER CHARGES
A. A. Shapran, B. A. Ososkov, and V. I. Pleskach 1984 4 p ref Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chern. Met. (USSR), no. 5, 1984 p 156
(BLL-M-36033-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

An invention allowing the determination of vertical sintering speeds to be found more easily is described and some of the practical problems involving its implementation discussed. Author

N85-15870 British Library Lending Div., Boston Spa (England).
RECIPROCAL SOLUBILITY OF PHASES IN MULTI-COMPONENT SYSTEMS
G. I. Silman 3 Dec. 1984 8 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chernaya Met. (USSR), no. 5, 1984 p 10-13
(BLL-M-36003-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

An analysis was made of reciprocal solubility of phases in iron carbon alloying element systems. The position of lines of solubility for these systems can be determined from the coefficients of interphase distribution of elements. Parameters of interaction of components in stoichiometric compounds can be calculated on the basis of phase analysis. Derived equations were used to calculate the parameters of interaction between certain alloying elements (Cr, Mn, Ni, Si) and carbon in cementite and the coefficients of the effect of these alloying elements on carbon solubility in an iron melt in equilibrium with cementite. Results indicate that alloying elements affect the solubility of graphite and cementite in the melt both quantitatively and in sign and accordingly affect the position of the line of lowest points of both eutectics. Author

N85-15871 British Library Lending Div., Boston Spa (England).
INVESTIGATION OF GRANULES OF MOLYBDENUM-BASE ALLOYS OBTAINED WITH PULSED DISCHARGES
K. A. Myagkov and I. V. Blinkov 3 Dec. 1984 5 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (USSR), no. 5, 1984 p 90-93
(BLL-M-36012-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

The granules formed during plasma treatment of Mo-powder for 30 and 60 min were investigated using chemical, metallographic and X-ray analysis. The granules were obtained by deposition of titanium and carbon from the gas phase onto Mo-powder by pulsed electrical discharge heating. During solidification of this alloy, the deposited elements form finely dispersed carbide inclusions which harden the matrix metal. This hardening was confirmed by microhardness measurements on the powders. Author

N85-15872 British Library Lending Div., Boston Spa (England).
SOLID-PHASE SINTERING OF TANTALUM CARBIDE
N. N. Kondratev, S. Yu. Bykov, A. V. Manukhin, and Yu. A. Pavlov 3 Dec. 1984 6 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved., Chernaya Met. (USSR), no. 5, 1984 p 93-95
(BLL-M-36013-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

Compaction kinetics of tantalum, hafnium, and titanium carbide powders was examined during sintering. An empirical dependence of variation in the relative volume of pores on the duration of isothermal sintering was used to analyze compaction of porous semiproducts of tantalum carbide powder and equimolar mixtures of powders of tantalum and hafnium carbides and tantalum and titanium carbides. Author

N85-15873 British Library Lending Div., Boston Spa (England).
KINETICS OF INTERACTION BETWEEN CARBON AND IRON OXIDES OF METALLIZED MATERIALS IN SOLID PHASE
S. G. Bratchikov and A. M. Amdur 3 Dec. 1984 4 p Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved., Chernaya Met. (USSR), no. 5, 1984 p 148-149
(BLL-M-36023-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

Tests were conducted by the gravimetric method in an argon atmosphere to determine the kinetics of solid-phase interaction between the carbon and the iron oxides of metallized materials.

The influence of the temperature and composition of metallized pellets on the kinetics of reduction was determined. Results indicate that the studied interaction is controlled by the process of indirect reduction, which is carried out in diffusion conditions.
Author

N85-15874 Department of the Navy, Washington, D. C.
ALLOYS AND METHOD OF MAKING Patent
D. W. Forester, inventor (to Navy) Issued 4 Sep. 1984 6 p Supersedes AD-D010128
(AD-D011337; US-Patent-4,469,536; US-Patent-Appl-SN-440687; US-Patent-Class-148-403) Avail: US Patent and Trademark Office CSCL 11/6

Novel alloys composed of two immiscible metals are made by vapor-depositing the metals simultaneously onto a suitable substrate. By way of example, alloys of iron and bismuth or cobalt and bismuth may be produced according to this invention. Many of the novel alloys have useful ferromagnetic and magneto-optical properties. Author (GRA)

N85-15875*# Textron Bell Aerospace Co., Buffalo, N. Y. Electroforming Operations Dept.
STUDY OF HIGH PERFORMANCE ALLOY ELECTROFORMING Monthly Technical Progress Narrative, 26 Nov. - 21 Dec. 1984
G. A. Malone 7 Jan. 1985 6 p refs
(Contract NAS8-35817)
(NASA-CR-174276; NAS 1.26:174276) Avail: NTIS HC A02/MF A01 CSCL 11F

The nickel-manganese experimental electrolyte was hydrogen peroxide treated and carbon purified for removal of residual sodium saccharin and related organic decomposition products from the plating of previous test panels. The saccharin additive was used to reduce stress where high concentrations of manganese and high pulse peak current densities were used. A large quantity of nickel-manganese alloy plates containing 0.35 to 0.40 percent by weight manganese was electroformed for testing to supply data for a mechanical property data table. The aluminum billet required for the machining of the subscale SSME main combustion chamber was acquired. Author

N85-15876*# National Aeronautics and Space Administration, Washington, D. C.
STUDIES ON COPPER ALLOYS CONTAINING CHROMIUM ON THE COPPER SIDE PHASE DIAGRAM
Toshio Doi Dec. 1984 12 p refs Transl. into ENGLISH from Nippon Kinzoku Gakkaishi (Japan), v. 21, no. 5, 1957 p 337-340 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-4004)
(NASA-TM-77752; NAS 1.15:77752; Rept-1) Avail: NTIS HC A02/MF A01 CSCL 11F

Specimens were prepared from vacuum melted alloys of high purity vacuum melted copper and electrolytic chromium. The liquidus and eutectic point were determined by thermal analysis. The eutectic temperature is 1974.8 F and its composition is 1.28 wt% of chromium. The determination of solid solubility of chromium in copper was made by microscopic observation and electrical resistivity measurement. The solubility of chromium in solid copper is 0.6 wt% at 1050 F, 0.4 wt% at 1000 F, 0.25 wt% at 950 F, 0.17 wt% at 900 F, and 0.30 wt% at 840 F. Author

N85-15877*# Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.
THERMAL-MECHANICAL FATIGUE CRACK GROWTH IN INCONEL X-750 Final Report
Normand Marchand and Regis M. Pelloux Oct. 1984 17 p refs
(Grant NAG3-280)
(NASA-CR-174740; NAS 1.26:174740) Avail: NTIS HC A02/MF A01 CSCL 11F

Thermal mechanical fatigue crack growth (TMFCG) was studied in a gamma-gamma' nickel base superalloy Inconel X-750 under controlled load amplitude in the temperature range from 300 to 650 C. In-phase (T sub max at sigma sub max), out-of-phase (T sub min at sigma sub max), and isothermal tests at 650 C were performed on single-edge notch bars under fully reversed cyclic conditions. A dc electrical potential method was used to measure crack length. The electrical potential response obtained for each cycle of a given wave form and R value yields information on crack closure and crack extension per cycle. The macroscopic crack growth rates are reported as a function of delta k and the relative magnitude of the TMFCG are discussed in the light of the potential drop information and of the fractographic observations.
R.S.F.

N85-15878*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OPTIMIZATION OF THE NiCrAl-Y/ZrO-Y2O3 THERMAL BARRIER SYSTEM
Stephan Stecura 1985 24 p refs Presented at the 87th Ann. Meeting of the American Ceramic Society, Cincinnati, 5-9 May 1985
(NASA-TM-86905; E-2394; NAS 1.15:86905) Avail: NTIS HC A02/MF A01 CSCL 11F

The effects of bond and thermal barrier coating compositions, thicknesses, and densities on air plasma spray deposited Ni-Cr-Al-Y/ZrO2-Y2O3 life were evaluated in cyclic furnace oxidation tests at temperatures from 1110 to 1220 C. An empirical relation was developed to give life as a function of the above parameters. The thermal barrier system tested which had the longest life consisted of Ni-35.0 wt% Cr-5.9 wt% Al-0.95 wt% Y bond coating and ZrO2-6.1 wt% Y2O3 thermal barrier coating. Author

N85-15879*# National Aeronautics and Space Administration, Washington, D. C.
ON HEAT-TREATABLE COPPER-CHROMIUM ALLOY, 1
Shigeyasu Koda and Eiki Isono Dec. 1984 14 p refs Transl. into ENGLISH from Nipon-Kinzoku-Gakkai-Shi (Japan), v. 16, 1952 p 213-217 Presented at the Conv. of the Soc. of Met., Kobe, Japan, Oct. 1951 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prepared by Hokkaido Univ., Japan
(Contract NASw-4004)
(NASA-TM-77753; NAS 1.15:77753) Avail: NTIS HC A02/MF A01 CSCL 11F

A mother alloy of 10% Cr and 90% Cu was prepared by sintering. This was alloyed with the Cu melt and Cu-Cr alloys containing about 0.5% Cr was obtained. These alloys could be deformed easily in both the hot and cold states. By measuring the hardness change, age-hardening properties of cast alloys were studied, which were quenched from 950 deg and aged at 300 to 700 deg for 1 hour. The maximum hardness was obtained with the tempering temperature of 500 deg. For the temperature of solution-treatment, 950 deg was insufficient and that above 1000 deg necessary. For the tempering time, a treatment at 500 deg for 1 hr. or at 450 deg for 3 hrs. yielded the maximum hardness. As for the properties for electrical conductors, 3 kinds of wires (diam. 2 mm.) were made: (1) after cold-drawn to 2 mm., solution-treated, quenched, and then tempered (500 deg, 1 hr.); (2) after quenching, cold-drawn (75% reduction) to 2 mm. and tempered (500 deg, 1 hr.); and (3) after quenching, cold-drawn (81%) to intermediate diameter, tempered (500 deg, 1 hr.) and then cold-drawn (88%) again. Properties obtained for the 3 kinds, respectively, were as follows: conductivity 91, 90, and 86%. Tensile strength and strength for electrical conductivity are given. Author

N85-15880*# Grumman Aerospace Corp., Bethpage, N.Y. Materials and Structural Mechanics Directorate.
SPAR X TECHNICAL REPORT FOR EXPERIMENT 76-22 DIRECTIONAL SOLIDIFICATION OF MAGNETIC COMPOSITES
James Bethin Nov. 1984 51 p refs
(Contract NAS8-32219)
(NASA-CR-171271; NAS 1.26:171271; RE-691) Avail: NTIS HC A04/MF A01 CSCL 11F

The effects of gravity on Bridgman-Stockbarger directional solidification of off-eutectic Bi/MnBi were studied in reduced gravity aboard the SPAR X flight and compared to normal-gravity investigations and previous eutectic Bi/MnBi SPAR flight experiments. The directional solidification of off-eutectic Bi/MnBi results

in either a dendritic structure connected with local cooperative growth or a coupled low volume fraction faceted/non faceted aligned rod eutectic whose Mn macrosegregation, MnBi rod size, interrod spacing, and thermal and magnetic properties are sensitive functions of the solidification processing conditions. Two hypoeutectic and two hypereutectic samples were solidified during 605 sec of furnace travel, with an initial 265 sec low-gravity interval. Comparison Earth-gravity samples were solidified in the same furance assembly under identical processing conditions. Macrosegregation in the low-g samples was consistent with a metastable increase in Mn solubility in the Bi matrix, in partial agreement with previous Bi/MnBi SPAR findings of MnBi volume reduction.R.S.F.

N85-15881# Lockheed-California Co., Burbank.
EVALUATION OF THE ALKALINE PEROXIDE PRE-BOND SURFACE TREATMENT FOR TITANIUM Final Report
J. Harper-Tervet and D. H. Neff Warminster, Pa. Naval Air Development Center Oct. 1983 48 p
(Contract N62269-82-C-0284; F61-542)
(AD-A147352; NADC-84124-60) Avail: NTIS HC A03/MF A01 CSCL 11/1

Alkaline peroxide and Pasajell 107 pre-bond treatments were evaluated with three different adhesives in an effort to increase the durability of bonded titanium structures. Lap shear, wedge and stress durability specimens were prepared and pre-bond surfaces were evaluated after environmental exposures up to six months. Titanium-to-titanium results showed the alkaline peroxide treatment exhibited higher lap shear strengths than the Pasajell 107 treatment at both RT and 180 F. When the adhesives were used without primer, the Pasajell 107 treatment exhibited slightly higher lap shear strengths. The majority of titanium-to-graphite lap shear coupons failed in the composite, confirming the lower interlaminar strength of the composite when compared to the adhesive bonds. Wedge tests were conducted on panels that were cleaned and then stored for 0 month, 3 months and 6 months at elevated temperature and humidity. The alkaline peroxide treated specimens exhibited markedly higher durability than the Pasajell 107 treated specimens. Overall the alkaline peroxide treated specimens demonstrated comparable initial strength to the Pasajell 107 cleaned specimens, but when exposed for various periods of time to elevated temperature and humidity, the alkaline peroxide treated specimens provided a significantly more stable surface and thus a more durable bond. GRA

N85-15882# Dayton Univ., Ohio.
MECHANICAL PROPERTY DATA 7050-t736511 ALLOY
Oct. 1984 5 p
(Contract F33615-82-C-5102)
(AD-A147365; AD-F300486; UDR-TM-84-35) Avail: NTIS HC A02/MF A01 CSCL 11/6

The 7050 Aluminum Alloy was processed and formed into various shapes by extrusion. These extrusions were heat treated to the T736511 temper. Data from samples of the 12 extrusions are included in this report. The average values for tension, compression, shear and bearing are listed by specimen direction. The elongation data presented was generated from long rectangular samples only. The shear results were obtained from the Amsler double pin shear fixture. GRA

N85-15883# Army Armament Research and Development Command, Watervliet, N. Y. Large Caliber Weapon Systems Lab.
APPLICATION OF THE DIFFRACTION MODEL TO AMORPHOUS MAGNESIUM ZINC ALLOYS Final Report
P. J. Cote and L. V. Meisel Sep. 1984 14 p
(AD-A147369; AD-E440259; ARLCB-TR-84031) Avail: NTIS HC A02/MF A01 CSCL 11/6

Amorphous magnesium-zinc (a-MgZn) alloys comprise the best system available for testing the diffraction model for electron transport in non-crystalline alloys. They are simple metal binary alloys. Conventional methods exist for determining electronic parameters in the model. They exhibit low resistivities so that saturation effects are not expected to dominate. They are well characterized and extensive resistivity data are available. Computed results presented here are based on a refinement of previous calculations; the alloy scattering matrix elements with computed phase shifts for Mg and Zn are used with the substitutional model instead of the adjusted effective potential assumed previously. Results obtained ignoring mean free path effects are in qualitative agreement with the data; agreement is surprisingly detailed when account is taken of saturation effects. GRA

N85-15884# Department of the Air Force, Washington, D.C.
METHOD FOR MAKING ALLOY ADDITIONS TO BASE METALS HAVING HIGHER MELTING POINTS Patent Application
H. B. Bomberger, inventor (to Air Force) Filed 15 Aug. 1984 8 p
(AD-D011403; US-Patent-Appl-SN-640916) Avail: NTIS HC A02/MF A01 CSCL 11/6

This abstract discloses a method for adding alloying elements having relatively low boiling points to base metals having relatively high melting points. The base metal is combined with the melting point-lowering metal; or metalloid and to this mixture is added the desired alloying element or elements. No special equipment is required for this method. The first metals included within the scope of this invention are selected from the group consisting of Ba, Ca, Li, Mg and Zn. Each of these metals has a relatively low boiling point and, with the exception of Zn, a relatively low density. The more refractory base metals included within the scope of this invention are selected from the group consisting of Groups IB, IVB, VB, VIB and VIII of the Periodic Table of the Elements. Of particular interest are Cu from IB, Ti and Zr from IVB, Nb and Ta from VB, Cr and W from VIB and Fe, Co and Ni from VIII. GRA

N85-15885# Oak Ridge National Lab., Tenn. Metals and Ceramics Div.
DESIGN OF ORDERED INTERMETALLIC ALLOYS FOR HIGH-TEMPERATURE STRUCTURAL USE
C. T. Liu 1984 20 p refs Presented at the High-Temp. Alloys-Theory and Design Conf., Bethesda, Md., 8 Apr. 1984
(Contract DE-AC05-84OR-21400)
(DE85-000897; CONF-840417-3) Avail: NTIS HC A02/MF A01

Many ordered intermetallic alloys possess attractive high-temperature properties; however, low ductility and brittle fracture restrict their use for structural applications. Current work on alloy design of ordered intermetallics based on the Ni3V-Co3V-Fe3V and Ni3Al systems is summarized. Both macroalloying and microalloying were used to improve the ductility and fabricability of these alloys. Macroalloying is aimed at controlling ordered crystal structures and properties in (Ni, Co, Fe)3V alloys, whereas microalloying is directed toward alleviating both intrinsic and extrinsic grain-boundary weakness in nickel aluminides based on Ni3Al. Success in development of these ductile intermetallics is discussed, with emphasis on metallurgical principles involved in the alloy design. DOE

N85-15886# Fraunhofer-Inst. fuer Betriebsfestigkeit, Darmstadt (West Germany).
FATIGUE STRENGTH OF DIFFERENT SINTERED STEELS AND DESIGN CRITERIA FOR POROUS MATERIAL (PM) PARTS
C. M. Sonsino 1984 203 p refs In GERMAN; ENGLISH summary
(LBF-FB-170/84; ISSN-0721-5320) Avail: NTIS HC A10/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 130

The application of fatigue design criteria to an angle lever and a turbo charger bushing is demonstrated by measuring the strength distributions in the critical areas of the parts and by deriving the manufacturing parameters for a fail safe service. This method reduces the time of development significantly. Author (ESA)

N85-15887# Kernforschungsanlage, Juelich (West Germany). Inst. fuer Grenzflaechenforschung und Vakuumphysik.
DIFFUSION IN METALS UNDER HIGH MECHANICAL STRAIN AND ACCELERATION Thesis - Bonn University [DIFFUSION IN METALLEN UNTER DEM EINFLUSS VON HOHEN MECHANISCHEN SPANNUNGEN UND BESCHLEUNIGUNGEN]
A. Weller May 1984 112 p refs In GERMAN; ENGLISH

summary
(JUEL-1913; D-5; ISSN-0366-0885) Avail: NTIS HC A06/MF A01

In order to investigate the influence of mechanical stress and centrifugal forces on diffusion in metals an apparatus in which ferromagnetic samples with a diameter of 15 to 20 mm can be magnetically suspended in high vacuum was constructed. The cylindrical samples are rotated around the axis of symmetry and they can be heated by radiation up to 850 K. The maximum frequency of rotation is determined only by the strength of the material. For the precise determination of the sample temperature a method based on the radiative interaction of the sample with its environment was developed. Measurements of the diffusion coefficients were carried out using iron cylinders covered with a thin layer of aluminum. Evaluation of the diffusion profiles shows that the influence of mechanical stress is too small to be detected by the experimental arrangement used. High centrifugal fields can be used as a tool for studying fast diffusion. Author (ESA)

N85-15888# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
A METALLOGRAPHIC INVESTIGATION OF ROTATING BANDS FOR 7.5 cm ARTILLERY PROJECTILES
Lars Ekbom and Brigitta Persson Sep. 1984 43 p refs In SWEDISH; ENGLISH summary
(FOA-C-20551-D2; ISSN-0347-3694) Avail: NTIS HC A03/MF A01

After firing tests, metallographic examination of fired and covered bands was undertaken, and results from investigations of four rotating bands including three copper bands are presented: one unprepared, one provided with a tin foil, and one with a plastic ring. The fourth has a copper-nickel band with a tin foil. Investigations show that the performance of a copper-nickel band is better than that of a copper band. A ring of polyethylene applied between the two rotating bands decreases wear of the bands during passage through the gun launcher. At the firing tests an improvement is obtained, especially for the dispersion in muzzle velocity if a tin foil is applied to the rotating band surface; this effect is not explained by the metallographic investigations.
Author (ESA)

N85-15739# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany). Materials Lab.
COMPARISON BETWEEN THE PROPERTIES OF CONVENTIONAL WROUGHT AND POWDER METALLURGICAL ALLOYS FOR TURBINE DISC APPLICATIONS
G. W. Koenig *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 11 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

N85-15740# Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Evry Cedex (France). Lab. des Materiaux et Procedes.
INCONEL 718 ALLOY RESISTANCE TO CRACK PROPAGATION [RESISTANCE A LA PROPAGATION DE FISSURES DE L'ALLIAGE INCONEL 718]
L. Poret, J. Y. Geudou, and A. Pineau (Ecole des Mines de Paris) *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 11 p refs In FRENCH (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

N85-15749# Brown, Boveri und Cie, A.G., Mannheim (West Germany).
MECHANICAL ASPECTS OF HIGH TEMPERATURE COATINGS
K. Schneider and H. W. Gruenling *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 17 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

N85-16042# Joint Publications Research Service, Arlington, Va.
ARC EROSION OF METAL IN CURRENT INTERVAL OF 1-10 AMPERES Abstract Only
Nikolay Leonidovich Pravoverov and Aleksandr Ivanovich Struchkov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 34-35 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Elektromekhan. (Novocherkassk, USSR), no. 7, Jul. 1984 p 64-69 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

27 NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N85-15889 Department of the Navy, Washington, D. C.
FLUORINATED DIACRYLIC ESTERS Patent
J. R. Griffith and J. G. ORear, inventors (to Navy) Issued 5 Jun. 1984 4 p
(AD-D011328; US-Patent-4,452,998; US-Patent-Appl-SN-405772; US-Patent-Class-560-221) Avail: US Patent and Trademark Office CSCL 11/9

Acrylic polymers, whether linear or cross-linked, are excellent adhesives. They can be easily fabricated into many different components and shapes. Acrylics have exceptional optical clarity, strength, and dimensional and color stability. They have a convenient liquid-to-solid transition upon curing and can be curved by radiation. Fluorocarbons have a much broader resistance to physical and chemical attack than acrylic polymers, but lack the advantages of acrylic polymers. It is an object of the present invention to substantially increase the fluorocarbon content in acrylic resins, without interfering with the acrylate properties. Another object of this invention is to vary the fluorine content of fluroacrylic resins over wide ranges through the placement of perfluoroalkyl pendant groups of different lengths. These and other objects are achieved by reacting a fluoroaromatic dol and acryloyl chloride in a highly fluorinated solvent with an acid acceptor to form a fluorinated diacrylate ester monomer and purifying the monomer by forming a solution, adding decolorizing carbon to the solution and percolating the solution through activated alumina.
GRA

N85-15890 Department of the Navy, Washington, D. C.
HIGH TEMPERATURE ULTRA-HIGH VACUUM INFRARED WINDOW SEAL Patent
T. J. Manuccia, J. R. Peele, and C. E. Geosling, inventors (to Navy) Issued 15 May 1984 6 p
(AD-D011333; US-Patent-4,448,000; US-Patent-Appl-SN-372341; US-Patent-Class-52-208) Avail: US Patent and Trademark Office CSCL 11/1

This abstract discloses a window seal apparatus capable of transmitting infrared radiation for use under high temperature ultra-high vacuum conditions. The apparatus includes a window clamped between an annular rim of a clamp flange and an annular rim of a sealing flange. The rim of the sealing flange includes an annular sealing knob machined therein having an annular indentation in its upper surface. An annular lead gasket is located between the sealing knob and one side of the window. An annular lead gasket having roughened surfaces is positioned adjacent to the other side of the window and TEFLON gasket is positioned adjacent to the annular rim of the clamp flange. A constant force means is provided for pushing the clamp flange toward the window and the sealing flange thereby producing a seal therebetween. The window is preferably formed form alkali halide material. Author (GRA)

N85-15891 Department of the Navy, Washington, D. C.
METHOD FOR BONDING INSULATOR TO INSULATOR Patent
H. Wohltjen and J. F. Giuliani, inventors (to Navy) Issued 5 Jun. 1984 5 p Supersedes AD-D010149
(AD-D011340; US-Patent-4,452,624; US-Patent-Appl-SN-451893; US-Patent-Class-65-40) Avail: US Patent and Trademark Office CSCL 11/1

This abstract discloses a method for making an airtight seal between a pair of insulator elements, such as glass plates, without destroying any fine structure etched in the insulator elements. A thin metal film is deposited on one of the elements to be sealed and then placed in intimate contact with the other element to be sealed. The elements are then heated to a temperature well below their softening point, but high enough to significantly enhance the ion mobility in the insulator. A voltage is applied across the interface and the resulting anodic reaction consumes the film at the interface while producing a strong hermetic bond between the insulator elements. GRA

N85-15892*# United Technologies Research Center, East Hartford, Conn.
IMIDE MODIFIED EPOXY MATRIX RESINS Final Report
D. A. Scola Mar. 1984 74 p refs
(Contract NAS3-23528)
(NASA-CR-174695; NAS 1.26:174695; R84-916161-14) Avail: NTIS HC A04/MF A01 CSCL 11G

The results of a program designed to develop tough imide modified epoxy resins cured by bisimide amine (BIA) hardeners are described. State-of-the-art epoxides MY720 and DER383 were used, and four bismide amines were evaluated. These were the BIA's derived from the 6F anhydride (4,4'-(hexafluoroisopropylidene) bis(phthalic anhydride) and the diamines 3,3'-diaminodiphynyl sulfone, 4,4'-oxygianiline, 4,4'-methylene dianiline, and 1,12-dodecane diamine. A key intermediate, designated 6F anhydride, is required for the synthesis of the bisimide amines. Reaction parameters to synthesize a precursor to the 6F anhydride (6FHC) in high yields were investigated. The catalyst trifluoromethane sulfonic acid was studied. Although small scale runs yielded the 6FHC in 50 percent yield, efforts to ranslate these results to a larger scale synthesis gave the 6FHC in only 9 percent yield. Results show that the concept of using bisimide amine as curing agents to improve the toughness properties of epoxies is valid. R.S.F.

N85-15893*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FUNDAMENTAL TRIBOLOGICAL PROPERTIES OF CERAMICS
Donald H. Buckley and Kazuhisa Miyoshi 1985 25 p refs Presented at the 9th Ann. Conf. on Composites and Advan. Ceram. Mater., Cocoa Beach, Fla., 20-24 Jan. 1985; sponsored by the American Ceramic Society
(NASA-TM-86915; E-2386; NAS 1.15:86915) Avail: NTIS HC A02/MF A01 CSCL 11B

When a ceramic is brought into contact with itself, another ceramic, or a metal, strong bond forces can develop between the materials. Adhesion between a ceramic and itself or another solid are discussed from a theoretical consideration of the nature of the surfaces and experimentally by relating bond forces to the interface resulting from solid state contact. Elastic, plastic, and fracture behavior of ceramics in solid-state contact are discussed as they relate to friction and wear. The contact load necessary to initiate fracture in ceramics is shown to be appreciably reduced with tangential motion. Both friction and wear of ceramics are anisotropic and relate to crystal structure as with metals. Both free energy of oxide formation and the d valence bond character of metals are related to the friction and wear characteristics for metals in contact with ceramics. Lubrication is found to increase the critical load necessary to initiate fracture of ceramics with sliding or rubbing contact. R.S.F.

N85-15894*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EVALUATION OF COLORLESS POLYIMIDE FILM FOR THERMAL CONTROL COATING APPLICATIONS
Anne K. St.Clair and Wayne S. Slemp Jan. 1985 21 p refs
(NASA-TM-86341; NAS 1.15:86341) Avail: NTIS HC A02/MF A01 CSCL 11B

A series of essentially colorless aromatic polyimide films was synthesized and characterized with the objective of obtaining maximum optical transparency for applications in space. Optical transparency is a requirement for high performance polymeric films used in second surface mirror coatings on thermal control systems. The intensity in color of aromatic polyimide films was lowered by reducing the electronic interaction between chromophoric centers in the polymer molecular structure and by using highly purified monomers. The resulting lightly colored to colorless polyimide films were characterized by UV-visible and infrared spectroscopy before and after exposure to 300 equivalent solar hours UV irradiation and varying doses of 1 MeV electron irradiation. After irradiation, the films were found to be 2 to 2.5 times more transparent than commercial polyimide film of the same thickness. Author

N85-15895*# Case Western Reserve Univ., Cleveland, Ohio.
EXPERIMENTAL TEST PROGRAM FOR EVALUATION OF SOLID LUBRICANT COATING AS APPLIED TO COMPLIANT FOIL GAS BEARINGS TO 315 DEG C Final Report
Robert C. Wagner Jan. 1985 54 p refs
(Contracts NCC3-30; DE-AI01-80CS-50194)
(NASA-CR-174837; DOE/NASA/0030-1; E-2416; NAS 1.26:174837) Avail: NTIS HC A04/MF A01 CSCL 11H

An experimental apparatus and test procedure was developed to compare the performance of two solid lubricant coatings for air lubricated compliant foil gas bearings in the temperature range of 25 to 315 C. Polyimide bonded additive (SBGC) were tested extensively for durability and frictional characteristics. A partial arc bearing constructed of Inconel X-750 was coated on the bore with one of these coatings. The foil was subjected to repeated start/stop cycles. Performance comparisons reveal that although both coatings survive thousands of start/stop cycles, only the PBGF coated bearing achieves the specified 9000 start/stops. There is enough wear on the SBGC coated bearing to warrant termination of the test prior to 9000 start/stop cycles due to coating failure. The frictional characteristics of the PBGF are better at the elevated temperatures than at lower temperatures; a marked increase in sliding friction occurs as the temperature decreases. The SBGC maintains relatively constant frictional characteristics independent of operating temperature. R.S.F.

N85-15896*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SURFACE EFFECTS OF CORROSIVE MEDIA ON HARDNESS, FRICTION, AND WEAR OF MATERIALS
Kazuhisa Miyoshi, Donald H. Buckley, George W. P. Rengstorff, and Hiroyuki Ishigaki 1985 20 p refs Presented at the Intern. Conf. on Wear of Mater., Vancouver, British Columbia, 14-18 Apr. 1985; sponsored by ASME
(NASA-TM-83711; E-2088; NAS 1.15:83711) Avail: NTIS HC A02/MF A01 CSCL 11G

Hardness, friction, and wear experiments were conducted with magnesium oxide exposed to various corrosive media and also with elemental iron and nickel exposed to water and NaOH. Chlorides such as MgCl2 and sodium containing films were formed on cleaved magnesium oxide surfaces. The MgCl2 films softened the magnesium oxide surfaces and caused high friction and great deformation. Hardness was strongly influenced by the pH value of the HCl-containing solution. The lower the pH, the lower the microhardness. Neither the pH value of nor the immersion time in NaOH containing, NaCl containing, and HNO3 containing solutions influenced the microhardness of magnesium oxide. NaOH formed a protective and low friction film on iron surfaces. The coefficient of friction and the wear for iron were low at concentrations of NaOH higher than 0.01 N. An increase in NaOH concentration resulted in a decrease in the concentration of ferric oxide on the iron surface. It took less NaOH to form a protective, low friction film on nickel than on iron. R.S.F.

N85-15897*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CONTACT ANGLE AND SURFACE TENSION MEASUREMENTS OF A FIVE-RING POLYPHENYL ETHER
William R. Jones, Jr. 1985 25 p refs Proposed for presentation at the Ann. Meeting of the American Society of Lubrication Engineers, Las Vegas, Nev., 6-9 May 1985

(NASA-TM-86927; E-2313; NAS 1.15:86927) Avail: NTIS HC A02/MF A01 CSCL 11G

Contact angle measurements were performed for a five-ring polyphenyl ether isomeric mixture on M-50 steel in a dry nitrogen atmosphere. Two different techniques were used: (1) a tilting plate apparatus, and (2) a sessile drop apparatus. Measurements were made for the temperature range 25 to 190 C. Surface tension was measured by a differential maximum bubble pressure technique over the range 23 to 220C in room air. The critical surface energy of spreading (gamma (sub c)) was determined for the polyphenyl ether by plotting the cosine of the contact angle (theta) versus the surface tension (gamma (sub LV)). The straight line intercept at cosine theta = 1 is defined as gamma (sub c). Gamma (sub c) was found to be 30.1 dyn/cm for the tilting plate technique and 31.3 dyn/cm for the sessile drop technique. These results indicate that the polyphenyl ether is inherently autophobic (i.e., it will not spread on its own surface film until its surface tension is less than gamma (sub c). This phenomenon is discussed in light of the wettability and wear problems encountered with this fluid. Author

N85-15898*# National Aeronautics and Space Administration, Washington, D. C.

OXIDATION RESISTANCE OF SILICON CERAMICS

Hasegawa Yasutoshi and Kazushi Hirota Apr. 1984 14 p refs Transl. into ENGLISH from Seramikkusu (Japan), v. 18, no. 7, 1983 p 580-585 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prepared by National Inst. for Research in Inorganic Materials, Japan

(Contract NASw-3542)

(NASA-TM-77429; NAS 1.15:77429) Avail: NTIS HC A02/MF A01 CSCL 11C

Oxidation resistance, and examples of oxidation of SiC, Si3N4 and sialon are reviewed. A description is given of the oxidation mechanism, including the oxidation product, oxidation reaction and the bubble size. The oxidation reactions are represented graphically. An assessment is made of the oxidation process, and an oxidation example of silicon ceramics is given. Author

N85-15899# Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.

SILAZANE PRECURSORS TO SILICON NITRIDE

D. Seyferth and G. H. Wiseman 10 Oct. 1984 13 p

(Contract N00014-82-K-0322)

(AD-A146791; TR-15) Avail: NTIS HC A02/MF A01 CSCL 11/2

Pyrolysis of the liquid, organic-soluble ammonolysis product of dichlorosilane in a nitrogen atmosphere gives silicon nitride in 70% yield. Ammonia and disilylamine are the volatile products which are given off. Also studied has been the ammonolysis of methyldichlorosilane. Preliminary studies of the conversion of the CH3SiHC12 ammonolysis product to ceramic materials are reported. Author (GRA)

N85-15900# California Univ., Berkeley. Dept. of Chemical Engineering.

GRADIENT POLYMERS Final Report, 1 Mar. 1975 - 31 Aug. 1983

M. C. Williams and J. E. Stoughton 31 Aug. 1984 20 p

(Contract N00014-75-C-0955)

(AD-A146836) Avail: NTIS HC A02/MF A01 CSCL 11/9

This paper discusses studies on nonuniform and nonequilibrium penetrant distributions wherein a gradient of the second polymer is frozen in place by the crosslinking reaction. In a general sense, it is expected that ultimately a wide range of physical properties--possibly some quite unique--will arise from controlling not only the choice of the two polymer species but also the composition gradient. The chemical system ultimately selected was a crosslinked polymethylmethacrylate (PMMA) host that was penetrated by a low-molecular-weight grade of polybutadiene (PB), subsequently to be further polymerized and crosslinked in its gradient position. Such a choice necessarily limits the scope of the present study to represent variations of only one class of material: the two-component rubber-toughened plastic. However, this is a very important class of structural plastic, and the possible compositional variations are highly diverse in principle. Primary results consist of the measured responses to various types of mechanical deformation, including ultimate limits. These are coupled with information about the chemical composition (averages, and gradient character) and the microstructure to develop correlations and predictive rules for material performance. GRA

N85-15901# Navy Clothing and Textile Research Facility, Natick, Mass.

FLAME-RESISTANT MATERIALS FOR USE IN PYROTECHNIC SAFETY CLOTHING Final Technical Report

Z. Kupferman and H. P. Winer Sep. 1984 58 p

(AD-A146857; NCTRF-158) Avail: NTIS HC A04/MF A01 CSCL 06/7

Twelve material assemblies were tested for possible use in pyrotechnic safety clothing that the Navy Clothing & Textile Research Facility (NCTRF), undertook to develop for the U.S. Army Munitions Production Base Modernization Agency. The 12 assemblies, each containing an outershell flame-and-heat block fabric, high-temperature-resistant batt insulation, and expanded polytetrafluoroethylene (PTFE) plastic film laminated to a 3.2-ounce Nomex fabric, were exposed to a flash-off of 15 pounds of pyrotechnic illuminant composition. Two of the outershell fabrics, a 15.5-ounce PBI/OPF (20/80) fabric and a 16-ounce OPF fabric, along with Kynol and Kevlar batt insulations, were found to be significantly better than the others. Either of the two outershell fabrics in assembly with Kevlar or Kynol batts should show a temperature transmission of less than 115 degrees F as determined with a skin simulant sensor when exposed to a 6-second flash-off of about 5500 degrees F. For the initial prototype pyrotechnic safety clothing, NCTRF recommended a fabric assembly containing a 15.5-ounce PBI/OPF (20/80) flame-and-heat block outershell fabric, a 10-ounce para-armaif (Kevlar) batt insulation, and a vapor barrier/comfort fabric consisting of a moisture-vapor-permeable plastic film (PTFE) laminated to a 5.5-ounce FR cotton fabric. NCTRF also recommended consideration of PBI webbing hold-down straps and PBI sewing thread. GRA

N85-15902# Northwestern Univ., Evanston, Ill. Dept. of Chemistry and Materials Research.

POLYPHOSPHAZENE SOLID ELECTROLYTES Interim Technical Report

Peter M. Blonsky, D. F. Shriver, Paul Austin (Pennsylvania State Univ., University Park), and H. R. Allcock (Pennsylvania State Univ., University Park) 1 Oct. 1984 9 p

(Contract N00014-80-C-0532)

(AD-A147008; TR-009) Avail: NTIS HC A02/MF A01 CSCL 07/4

The phosphazene polymer (NP(OC2H40C2H4OCH3)n, MEEP, was synthesized and amorphous solvent-free salt complexes were performed with LiSO3CF3, NaSO3CF3, Sr(SO3CF3)2, and AgSO3CF3. A material with the composition (LiSO3CF3)0.25. MEEP has a conductivity of .00008 ohm/cm at 30 C, which is much higher than corresponding poly (ethylene oxide) complexes. The phosphazene electrolytes are promising materials for ambient-temperature high energy density batteries. GRA

N85-15903# Texas Univ., Austin. Dept. of Chemical Engineering.

PROPERTIES OF MISCIBLE POLYMER BLENDS Final Report, 1 Sep. 1981 - 31 Aug. 1984

D. R. Paul and J. W. Barlow 30 Sep. 1984 12 p

(Contract DAAG29-81-K-0147)

(AD-A147090; ARO-18559.17-CH) Avail: NTIS HC A02/MF A01 CSCL 07/4

The physical properties of a variety of miscible and partially miscible binary polymer blends were evaluated. Where possible, these properties were related to the intermolecular interactions responsible for blend miscibility. The properties of the miscible blends examined were found to be more strongly influenced by the blend composition and the inherent properties of the blend

components than by the nature of the intermolecular interactions. For example, miscible polycarbonate/copolyester blends were found to thermally embrittle due to molecular relaxations when annealed for extended periods below the blend Tg; a phenomenon which is also observed for both pure components. For this same system, we have also demonstrated that the rate of hydrolysis of the polycarbonate component in the blend is substantially the same as is observed for pure polycarbonate. The inherently more stable polyester component can be used to produce blends with improved stability relative to polycarbonate. A new thermodynamic model has been developed which shows promise for understanding and predicting polymer-polymer miscibility and the miscibility window that is often observed when copolymers with varying monomer contents are mixed with the outer blend component. Several experimental blend systems, including poly(styrene-co-maleic anhydride) / poly(styrene-co-acrylonitrile), poly(vinyl chloride) / aliphatic polyesters, Phenoxy / aliphatic polyesters, and the newly discovered poly(epichlorohydrin) blends with acrylates and methacrylates have been prepared and analyzed in terms of this model. GRA

N85-15904# Department of the Navy, Washington, D. C.
MOISTURE ABSORBING ANTI-ARCING COATING AND METHOD FOR APPLYING SAME Patent Application
C. Ritter and R. W. Kreps, inventors (to Navy) Filed 4 Apr. 1984 6 p
(AD-D011310; US-Patent-Appl-SN-596784) Avail: NTIS HC A02/MF A01 CSCL 11/3

A moisture absorbing, anti-arcing compound comprises a mixture of a moisture active isocyanate resin and a generic anti-arcing compound. The isocyanate resin reacts with residual moisture in a high voltage ceramic insulator, thus tying it up chemically. This prevents diffusion of the moisture into the anti-arcing compound and resultant degradation. The compound according to this invention is especially useful for ceramics which may not be baked dry at elevated temperatures. Author (GRA)

N85-15905# Department of the Navy, Washington, D. C.
PROCESS FOR PREPARATION OF CROSSLINKED POLY(TRI-n-BUTYLTIN) METHACRYLATE WITH SIMULTANEOUS PARTICLE SIZE REDUCTION Patent Application
D. G. Glasgow and J. I. Satanek, inventors (to Navy) Filed 14 May 1984 11 p
(AD-D011313; US-Patent-Appl-SN-609940) Avail: NTIS HC A02/MF A01 CSCL 11/3

Poly(tri-n-butyltin) methacrylate, an anti-fouling compound, is prepared by esterifying a cross-linked poly-methacrylic acid with tributyltin oxide in the presence of a poly solvent. The poly solvent, such as acetone, dioxane or methyl-ethyl ketone, causes particle size reduction due to hydraulic shattering. The in-reaction particle size reduction eliminates the need for mechanical post grinding in the current process. Author (GRA)

N85-15906# Vanderbilt Univ., Nashville, Tenn. Dept. of Mechanical and Materials Engineering.
THE RELATIONSHIP BETWEEN RADIATION SENSITIVITY AND REDOX EQUILIBRIA Final Report, 1 Jun. 1981 - 31 Jul. 1984
D. L. Kinser Sep. 1984 234 p
(Contract DAAG29-81-K-0118)
(AD-A147216; ARO-17942.8-MS) Avail: NTIS HC A11/MF A01 CSCL 11/2

The objective of this research program is to achieve an understanding of the relationship of glass processing variables to radiation sensitivity of the glass. Glass processing variables include melting time, melting atmosphere, cooling rate and annealing time. The principle applications of the results of this program are in fiber optic communication systems and other glass applications in radiation environments. Results indicate that optical defects, paramagnetic defects and electrical properties are subject to influence by glass processing variables. These processing effects also extend to the sensitivity of the properties to radiation damage. Author (GRA)

N85-15907# Atlanta Univ., Ga. Dept. of Chemistry.
SYNTHESIS AND CHARACTERIZATION OF UNIQUE LIQUID CRYSTALLINE BLOCK COPOLYESTERS. A PROPOSAL FOR A POLYMER RESEARCH CENTER AT THE ATLANTA UNIVERSITY Final Report, 1 Sep. 1980 - 31 May 1984
M. B. Polk, K. B. Bota, H. Banks, Y. H. Mariam, and J. L. Reed 1 Oct. 1984 92 p
(Contract N00014-80-C-0557)
(AD-A147280) Avail: NTIS HC A05/MF A01 CSCL 11/9

The objectives of the Polk and Bota research team were to prepare liquid crystal block copolyesters which contain cyclohexane and benzene rings. The properties of block copolymers resemble those of incompatible physical blends in some respects and homogenous random copolymers in other respects. Due to the presence of the intersegment bond which prevents the segments from separating, block copolymers usually exhibit two-phase morphology which on the micro level is similar to that of polymer blends on the macro-level. Instead of the averaging of the properties of the different components as found in homogeneous random copolymers, block copolymers display the properties characteristic of each of the components plus some new properties due to the block copolymer morphology. The objectives of the Polk and Bota research team were to use cyclohexane derivatives as the soft blocks and benzene derivatives as the hard block and to optimize the solubility, thermal, and mechanical properties of the resulting (-A-B sub n) block copolyesters while increasing the thermoplastic elastomeric character. GRA

N85-15908# Princeton Univ., N. J. Dept. of Chemical Engineering.
RUBBER-MODIFIED EPOXIES. 1: CURE, TRANSITIONS, AND MORPHOLOGY Technical Report, Apr. - Oct. 1984
L. C. Chan, J. K. Gillham, A. J. Kinloch, and S. J. Shaw Oct. 1984 63 p
(Contract N00014-84-K-0021)
(AD-A147377; TR-2) Avail: NTIS HC A04/MF A01 CSCL 11/9

A methodology for investigating cure and its relationship to the development of morphology and transitions for rubber-modified thermosetting systems has been developed. An aromatic tetrafunctional diamine-cured digly-cidyl ether of bisphenol A epoxy resin (maximum glass transition temperature 167 C) was modified separately with two reactive liquid rubbers; i.e., a prereacted carboxyl-terminated rubber and an amino-terminated rubber. In order to develop fully cured but distinct cure-dependent morphologies, the systems were cured isothermally at different temperatures until reactions ceased and then were postcured by heating above the maximum glass transition temperature. The maximum glass transition temperature of the matrix and the volume fraction of dispersed phase for the amino-terminated rubber-modified system were particularly sensitive to cure conditions in consequence of complications in the cure chemistry. GRA

N85-15909# Naval Civil Engineering Lab., Port Hueneme, Calif.
LABORATORY INVESTIGATION ON ADHESIVES FOR NAVAL FACILITIES CONSTRUCTION Final Report, Oct. 1980 - Oct. 1983
T. Novinson May 1984 36 p
(AD-A147453; NCEL-TN-1694) Avail: NTIS HC A03/MF A01 CSCL 11/1

This report summarizes 3 years of laboratory findings on the comparative bonding strengths of adhesives to different construction materials and the effects of simulated weathering on adhesive bond strength. An adhesive used for construction should have a minimal tensile bond strength of 1,000 psi with the adherends being bonded. The selection of an adhesive should not be based on initial tensile strength alone because some adhesives may weaken upon prolonged exposure to hot and cold temperatures, oxygen, or seawater. The strongest adhesives tested for most nonporous construction materials were two-part epoxies, peroxide-cured polyesters, peroxide-cured acrylics, and two-part urethanes. Although no single adhesive is suitable for bonding every type of material, a definite trend in general strength of the five classes of adhesives were discovered: chemically reacting, one- or two-

component adhesives (epoxies, polyesters, urethanes) are generally stronger than solvent-based or hot-melt adhesives, which are much stronger than most aqueous-based adhesives (casein, fish, glue, hide glue). GRA

N85-15910# Texas Christian Univ., Fort Worth. Dept. of Chemistry.
NEW SYNTHESIS OF PHOSPHAZENE POLYMERS Final Report
R. H. Neilson and P. Wisian-Neilson 10 Oct. 1984 13 p
(Contract DAAG29-81-K-0095)
(AD-A147567; ARO-17905.9-CH) Avail: NTIS HC A02/MF A01 CSCL 07/3

The project involves a detailed study of the synthesis, characterization, and reactivity of silicon-nitrogen-phosphorus compounds, some of which are useful precursors to an important class of inorganic polymers known as polyphosphazenes. Our results include the successful development of a new, general, and direct method for the synthesis of such polymers including poly(dimethylphosphazene), (Me2PN)n. Thus, we report here the synthesis of a variety of new phosphazenes including several homopolymers, copolymers, crosslinked polymers, and transition metal containing polymers. The latter and many other new types of phosphazenes are now readily accessible by a recently discovered anion formation reaction of the polymer precursors. GRA

N85-15911# Department of the Air Force, Washington, D.C.
CRYOGENIC GLASS-TO-METAL SEAL Patent Application
M. O. Landram, inventor (to Air Force) Filed 29 Aug. 1984 15 p
(AD-D011370; US-Patent-Appl-SN-645389) Avail: NTIS HC A02/MF A01 CSCL 11/1

A novel low temperature vacuum seal and method of making same for joining a nonmetallic element, such as an optical port, to a metallic element is described which comprises first and second thin metallic layer applied to the nonmetallic element to provide substantial adhesion and solderability to the nonmetallic element. A third metallic layer applied to the metallic element provides solderability to the metallic element. The nonmetallic and metallic elements are joined by a layer of low temperatures solder interfacing their respective solder surfaces. A further thin metallic layer may be applied to the nonmetallic element to provide substantial wettability to the solderable second layer. GRA

N85-15912# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
SALT ACTION ON CONCRETE
J. M. Sayward Aug. 1984 76 p
(AD-A147812; CRREL-SR-84-25) Avail: NTIS HC A05/MF A01 CSCL 11/2

Serious deterioration of concrete bridges by deicing salts is generally ascribed to depassivation and corrosion of reinforcing steel, as growth of its corrosion products causes spalling. Here, simple evaporative tests simulated the salt weathering that slowly crumbles rocks in nature, where crystals growing from pore water fed from below stress the matrix just as do ice crystals in frost heaving soil. Like needle ice (surface frost action in soil) the salt columns exuded from concrete also lifted tiny particles, signifying crumbling. Microcracks developed in 1-3 years of after-test dry storage. In a four-month simpler repeat test with salt, such cracks developed in all six concretes tested (five dolomitic, one siliceous). The siliceous one developed eye-visible cracks in three-year storage and a visible stone chip in the short repeat test, both with sodium chloride. The siliceous concrete also cracked badly within one week with strong calcium chloride and deteriorated completely in three-year storage. It also cracked badly with dilute calcium chloride or calcium nitrate exudation in tests with seawater may signify internal reaction plugging pores with insoluble magnesium hydroxide. This suggests a hypothetical means of control by addition of Mg++ to deicers or concrete. Present results suggest that neither corrosion of steel nor the C1- ion are requisite in salt action on concrete but that salt-caused microcracks may facilitate access of salt for cracking and also of carbon dioxide, water and salt for ultimate corrosion effects. GRA

N85-15913# METECH, Inc., Elverson, Pa.
THE REPLACEMENT OF PRECIOUS METAL THICK FILM INKS USING CONDUCTIVE POLYMER TECHNOLOGY. PHASE 1: FEASIBILITY STUDY Interim Technical Report
R. K. Selwood, G. Rosenberger, and A. Zelinski 9 Nov. 1984 8 p
(Contract N00014-84-C-0697; ARPA Order 4941)
(AD-A147814; ITR-1) Avail: NTIS HC A02/MF A01 CSCL 11/9

This is the First Interim Report on the Feasibility of Replacement of Precious Metals in Thick Film Technology with Conductive Polymer Materials. The initial phase of this study has concentrated on a literature review of existing conductive polymer technology, and preliminary experimentation utilizing conductive polymer materials in thick film circuit applications. GRA

N85-15914# Honeywell, Inc., Bloomington, Minn. Corporate Physical Sciences Center.
ELECTRICALLY CONDUCTING COMPLEXES OF POLY(3,6-n-METHYLCARBAZOLYL METHYLENE) Technical Report, Sep. - Nov. 1984
Samson A. Jenekhe, Stephen T. Wellinghoff (Minnesota Univ., Minneapolis), and Zhi Deng (Minnesota Univ., Minneapolis) 5 Nov. 1984 27 p Presented at the 188th ACS Natl. Meeting Symp. on Chem. of Conduction Polymers, Philadelphia, 26-31 Aug. 1984 Submitted for publication
(Contract N00014-84-C-0699)
(AD-A147884; PSC-84-37:8362) Avail: NTIS HC A03/MF A01 CSCL 11/9

Poly(3,6-n-methylcarbazolyl methylene) prepared by acid-catalyzed condensation polymerization of N-methylcarbazole with formaldehyde exhibits p-type semiconducting properties when doped with electron acceptors such as iodine, bromine, nitrosyl tetrafluoroborate, and nitrosyl hexafluoroantimonate. The polymer samples have glass transition temperature t sub g in the range 100-148 deg C, chain length in the range 13-25, and molecular weight distribution of 1.17-1.51. The polymer complexes with dopant anion (I-3, Br-3, BF-4) to polymer repeating unit ratio of 0.67-0.95 have d.c. conductivity of .001 to .1/ohm/.1 and a positive thermoelectric voltage at 23 deg C. An important new feature of the methylene-bridged polycarbazole conducting polymers is doping-induced polymer backbone conjugation of the form -CH2- yields =CH-. Evidence for this oxidation mechanism, converting methylene linkages to methine linkages, includes elemental analysis, infrared spectra, proton NMR, and electron spin resonance results. GRA

N85-15915# Harvard Univ., Cambridge, Mass. Div. of Applied Sciences.
STRUCTURAL RELAXATION AND ISOCONFIGURATIONAL FLOW OF A METALLIC GLASS NEAR EQUILIBRIUM Interim Report
S. S. Tsao (Sandia Labs, Albuquerque, N. Mex.) and F. Spaepen Aug. 1984 58 p
(Contract N00014-77-C-0002)
(AD-A147888; TR-25) Avail: NTIS HC A04/MF A01 CSCL 11/2

The isoconfigurational viscosity of amorphous Pd77.5Cu6Si16 in various states of structural relaxation was investigated over a wide temperature range. It was found to be thermal history dependent and non-Arrhenian. The lower the glass fictive temperature, and hence the more ordered the glass, the greater the departure from Arrhenian behavior. The non-Arrhenian behavior shows that the temperature dependence of the isoconfigurational viscosity cannot be ascribed entirely to the temperature dependence of the jump frequency of the flow defect. The obeerved crossover of isoconfigurational curves obtained from different structural states implies that the isoconfigurational viscosity cannot be a function of only a single structural parameter, such as the average free volume of the specimen. GRA

N85-15916*# Oak Ridge National Lab., Tenn.
DISPERSED METAL-TOUGHENED CERAMICS AND CERAMIC BRAZING

A. J. Moorhead, T. N. Tiegs, and R. J. Lauf 1983 8 p refs Presented at the Automotive Technol. Develop. Contractor Coord. Meeting, Dearborn, Mich., 13 Nov. 1983
(NASA Order C-74148-D; NASA Order C-72801-D; Contracts DE-AC05-84OR-21400; W-7405-eng-26)
(NASA-CR-174284; NAS 1.26:174284; DE85-001552; CONF-831142-3) Avail: NTIS HC A02/MF A01 CSCL 11G

An alumina (Al2O3) based material that contains approximately 1 vol% finely dispersed platinum or chromium was developed for use in high temperature thermal shock resistant electrical insulators. The work at ORNL is divided into two areas: (1) development of DMT ceramics; and (2) development of brazing filler metals suitable for making ceramic to ceramic and ceramic to metal brazements. The DMT ceramics and brazements are intended for service at elevated temperatures and at high stress levels in the dirty environments of advanced heat engines. The development and characterization of DMT ceramics includes processing (powder preparation, densification and heat treatment) and detailed measurement of mechanical and physical properties (strength, fracture toughness, and thermal conductivity). The brazing work includes: (1) the formulation and melting of small quantities of experimental brazing filler metals; (2) evaluation of the wetting and bonding behavior of these filler metals on Al2O3, partially stabilized zirconia and (ALPHA)-SiC in a sessile drop apparatus; and (3) determine the short term strength and fracture toughness of brazements. DOE

N85-15917# Starck (Hermann C.) Berlin, Goslar (West Germany). Forschungsabt.
DEVELOPMENT AND PRODUCTION OF IMPROVED SILICON CARBIDE POWDER FOR PRESSURELESS SINTERING AND HOT PRESSING Final Report, Aug. 1983
Gerd Schwier Bonn Bundesministerium fuer Forschung und Technologie Sep. 1984 28 p In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-84-211; ISSN-0340-7608) Avail: NTIS HC A03/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 6

Alpha-SiC powders and beta-SiC powders for pressureless sintering and hot pressing were developed and characterized. For the production of fine alpha-SiC powders SiC is used. Beta-SiC is synthetically prepared from silicon and carbon. Both materials are processed by milling and are chemically treated. The resulting sinteractive fine powders are characterized by high apparent densities and allow grain densities > 65% of the theoretical density. Due to low oxygen content and few contaminations which are homogenously distributed, these SiC-powders minimize flows in the sintered body. Author (ESA)

N85-15918# National Bureau of Standards, Boulder, Colo. Chemical Engineering Science Div.
THERMAL AND MECHANICAL PROPERTIES OF POLYURETHANE FOAMS AND A SURVEY OF INSULATING CONCRETES AT CRYOGENIC TEMPERATURES Final Report, Jan. 1979 - Feb. 1984
L. L. Sparks and J. M. Arvidson Chicago Gas Research Inst. Apr. 1984 154 p refs Sponsored by Gas Research Inst.
(PB85-100949/GAR; NBSIR-84/3011; GRI-84/0086) Avail: NTIS HC A08/MF A01 CSCL 11I

Thermal and mechanical properties of expanded plastics, foams, are reported. The system studied was rigid, closed cell, CC13F blown, polyether based polyurethane. The primary temperature range of study was 100 to 300 K; however, several properties were determined to 4 K. The nominal densities of the foams tested were 32, 64, and 96 kg/cu m. Properties reported are thermal conductivity, thermal expansion, strength and moduli in tension and in compression, proportional limit, yield strength, ultimate strength, and shear strength. Screening tests were done to determine the thermal conductivity, modulus of rupture, and the compressive strength of several polyester based materials with glass bead or perlite aggregate and of portland cement based materials with vermiculite or polystyrene aggregate. GRA

N85-16348*# Boeing Aerospace Co., Seattle, Wash.
CORROSION PROPERTIES OF SECOND-GENERATION CONDUCTIVE MATERIALS
Earl Groshart *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 7 p (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 11B

28 PROPELLANTS AND FUELS

Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

N85-15919# Michigan Univ., Ann Arbor. Dept. of Mechanical Engineering.
SOME CHARACTERISTICS OF AUTOMOTIVE GASOLINES AND THEIR PERFORMANCE IN A LIGHT AIRCRAFT ENGINE Final Report, Oct. 1982 - Mar. 1984
K. M. Morrison, Nak W. Sung, and D. J. Patterson Atlantic City FAA Nov. 1984 101 p refs
(Contract DOT-FA79NA-6083)
(FAA-CT-84-12) Avail: NTIS HC A06/MF A01

The primary purpose of this extensive test effort was to observe real-time operational performance characteristics associated with automotive grade fuel utilized by piston engine powered light general aviation aircraft. In fulfillment of this effort, baseline engine operations were established with 100LL aviation grade fuel followed by four blends of automotive grade fuel. A comprehensive sea - level - static test cell/flight test data collection and evaluation effort was conducted to review operational characteristics of a carbureted light aircraft piston engine as related to fuel volatility, fuel temperature, and fuel system pressure. Presented herein are results, data, and conclusions drawn from test cell engine operation as well as flight test operation on 100LL aviation grade fuel and various blends of automotive grade fuel. Sea-level-static test cell engine operations were conducted utilizing an AVCO Lycoming 0-320 engine connected to an eddy current dynamometer which facilitated data collection under various engine load conditions. Test cell instrumentation was utilized to obtain operational data (temperatures, pressures, flow rates, torque, horsepower, exhaust emissions, etc.) from idle through cruise to maximum power with fuel grades having Reid vapor pressures of 6.7, 8.0, 11.7, 14.0, and 14.4. Author

N85-15920# Boeing Military Airplane Development, Seattle, Wash.
AIRCRAFT WING FUEL TANK ENVIRONMENTAL SIMULATOR TESTS FOR EVALUATION OF ANTIMISTING FUELS Final Report, Sep. 1982 - Aug. 1984
P. M. McConnell, F. F. Tolle, and H. K. Mehta Atlantic City FAA Oct. 1984 107 p refs
(Contract DTFA03-83-C-00038)
(FAA-CT-84-15) Avail: NTIS HC A06/MF A01

The low temperature performance of antimisting kerosene (AMK) in airframe fuel systems and in certain engine fuel system components was studied and compared to Jet A fuel. Water vapor ingested into fuel tanks during simulation of repeated descents through clouds and rain had little effect on AMK. AMK retained antimisting properties during exposure to severe environmental flight simulations. Jet pump and boost pump operation had no discernable effect on AMK flammability. Jet pump performance with AMK was adversely affected. Main fuel boost pumps required up to 18 percent more power with AMK than with Jet A, and suction feed performance was lower with ambient and -20 C, but better than Jet A at -40 C. Boost pump performance was not affected by gel formations produced at low temperatures by the vapor removal return flow shearing of AMK. Aerodynamic heating and cooling of AMK in the fuel tank was similar to Jet A. A high

pressure pump and needle valve used to degrade the AMK was inadequate, resulting in filter bypass at low temperatures. Author

N85-15921# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
DISTRIBUTION AND STORAGE OF AVIATION TURBINE FUEL FOR MILITARY OPERATIONS IN NORTHERN AUSTRALIA M.S. Thesis
D. A. Whitty Sep. 1984 141 p
(AD-A147180; AD-E850744; AFIT/GLM/LSM/84S-63) Avail: NTIS HC A07/MF A01 CSCL 21/4

In northern Australia, prospective economic development is unlikely to create a distributed network of aviation turbine fuel storages sufficient to support Australian Defence Force operations in an emergency, and Defence investment in fuel storage facilities and distribution resources might be required. This thesis project was an effort to identify the key relationships in the operational fuels system, and to create a decision support system capable of indicating broad relationships and tradeoffs between decision variables. To answer investigative questions arising from a broad system review, relevant literature was examined, indicating a need to focus on the distribution system with five key elements: (1) demand, (2) bulk seaboard storage facilities, (3) base storage, (4) transport resources, and (5) transport represent system dynamics for distribution from bulk to base storage. Subject to correcting of input statistics, the results could be used to inform Defence decisions on facilities construction, and investment in transport resources. With recommended enhancements, the model could potentially be used to inform Defence contributions to national and international policy considerations. GRA

N85-15922# Pratt and Whitney Aircraft, West Palm Beach, Fla. Government Products Div.
EVALUATION OF JET FUEL DEPOSIT KINETICS. LOT 4 Final Report, Mar. 1983 - Mar. 1984
W. J. Purvis and R. J. Meehan Mar. 1984 48 p
(Contract N00140-80-C-0097)
(AD-A147196; PWA-FR-17658; NAPC-PE-107C) Avail: NTIS HC A03/MF A01 CSCL 21/4

Four selected JP-5 type Navy jet fuels were investigated with regard to their rate of thermally induced deposition using two analytical techniques. A modified research Jet Fuel Thermal Oxidation Tester (JFTOT), using a quartz-enclosed heater section in combination with a photosensitive detector, was to monitor the buildup of thermally induced fuel deposits. Concurrent with the JFTOT, tests were conducted using the Experimental Coking Apparatus (ECA) in order to establish comparable deposition rate data. The resultant Arrhenius analyses have contributed to understanding the impact of an invariant oxygen concentration on the specific fuel deposition rate. An attempt to measure the hydrocarbon peroxide associated with each fuel and the buildup of organo-peroxide with fuel temperature was inconclusive due to the variation in peroxide potential analysis (ASTM D-3703). Originator-supplied key words include: Coking. GRA

N85-15923# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
MAKING HIGH EXPLOSIVE BODIES FOR SHAPED CHARGES BY CASTING OR PRESSING. SHAPED CHARGE RESEARCH AT RESEARCH INSTITUTE OF NATIONAL DEFENCE (FOA) IN 1972 - 1983, PART 1
Torbjoern Karlen Sep. 1984 39 p refs In SWEDISH; ENGLISH summary
(FOA-C-20554-D4-Pt-1; ISSN-0347-3694) Avail: NTIS HC A03/MF A01

As intrinsic symmetry of the high explosive bodies is a prerequisite for obtaining a high penetration capability, especially at long standoffs, a method and equipment were developed for precision casting of truly symmetrical bodies. In the casting machine, de-airing and desiccation of the melted high explosive take place with thorough stirring under vacuum, then follows sedimentation under mechanical quietude and thermal equilibrium, and when a steady state is attained, a solidification front is allowed to move slowly upwards through the mixture according to a temperature control program. Intrinsic symmetry of the bodies can also be accomplished by isostatic pressing. Machining of high explosive bodies and methods for quantitative assessing of their intrinsic symmetry are dealt with. Author (ESA)

N85-15924# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
COMBUSTION PROPERTIES OF FUEL-RICH MAGNESIUM PROPELLANTS WITH HTPB AS BINDER
Torsten Liljegren Sep. 1984 26 p refs In SWEDISH; ENGLISH summary
(FOA-C-20555-D1; ISSN-0347-3694) Avail: NTIS HC A03/MF A01

Propellants with 25% to 35% ammonium perchlorate and up to 50% magnesium were test fired in a small rocket motor. The burning rate can be varied between 2 and 6 mm/sec by the content and particle size of the ammonium perchlorate and by addition of a burning catalyst, iron oxide. Except for a few compositions with low burning rate, the combustion is stable also at low pressure (0.5 MPa). Tests in a larger rocket motor with 3.3 kg of propellant give good expulsion efficiency (the ratio of mass of expelled combustion according to mass of propellant grain), 98%, at pressures up to 5 MPa. The propellant type is suitable for grains with radial burning, but because of the low burning rate, unsuitable for end-burning grains. Firing results are analyzed, e.g., influence of the particle size of the perchlorate and of the magnesium, and burning rate variations according to composition. Author (ESA)

N85-15925# California Univ., Berkeley. Membrane Bioenergetics Group.
PRODUCTION OF HYDROGEN BY CYANOBACTERIA Final Report, Apr. 1982 - Mar. 1984
Lester Packer Jun. 1984 80 p refs Sponsored by Gas Research Inst.
(PB85-113421/GAR; GRI-84/0113) Avail: NTIS HC A05/MF A01 CSCL 07E

Cyanobacteria (blue green algae) use sunlight to produce sugars and O2, as true plants do, yet also use N2 from the air to synthesize the basic building blocks needed by all life, and in a side reaction produce H2. A novel system to measure O2 production inside the cell was developed. The detection method is based on the interaction of unpaired electrons of O2 with unpaired electrons from a test nitroxide molecule. H2 production in the presence of sulfide is simulated by an order of magnitude. Three iron containing proteins in heterocysts act as catalysts for H2 production. The goal is to identify enough of the chemical steps leading to increased H2 gas production so that the process can be artificially improved. Another approach was to tune the system by controlling environmental factors. For this the adaptation process which allows the algae to grow at high salinity was used. GRA

31 ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; and cryogenics.

N85-15926 United Kingdom Atomic Energy Authority, Risley (England).
RISKS IN THE TRANSPORT AND STORAGE OF LIQUEFIED NATURAL GAS. SUB-PROJECT 5-2: INVESTIGATION INTO BUILDING DAMAGE
C. Gouwens and M. Dragosavic [1984] 32 p Transl. into ENGLISH of "Gevaren van Transport en Opslag van LNG. Deelproject 5-II: Onderzoek naar de Schade aan Gebouwen" rept. IBBC-TNO-B-76-35/04.2.02013 Instituut TNO voor Bouwmaterialen en Bouwconstructies, Netherlands, 10 Feb. 1976
(BLL-Risley-Tr-4608-(9091.9F); IBBC-TNO-B-76-35/04.2.02013) Avail: British Library Lending Div., Boston Spa, Engl.

The large reserves and increasing use of natural gas as a source of energy have resulted in its storage and transport becoming an urgent problem. Since a liquid of the same mass occupies only a fraction of the volume of a gas, it is economical to store natural gas as a liquid. Liquefied natural gas is stored in insulated tanks and also carried by ship at a temperature of -160 C to 170 C. If a serious accident allows the LNG to escape, a gas cloud forms. The results of a possible explosion from such a gas cloud are studied. The development of a leak, escape and evaporation, size and propagation of the gas cloud, the explosive pressures to be expected and the results on the environment are investigated. Damage to buildings is examined making use of the preliminary conclusions of the other sub-projects and especially the explosive pressures. B.G.

N85-15927# Institute of Gas Technology, Chicago, Ill.
IDENTIFICATION OF LEAKS: INTERNAL ACOUSTIC METHOD, PHASE 2 Final Report, Oct. 1982 - Jan. 1984
J. E. Huebler Aug. 1984 108 p refs Sponsored by Gas Research Inst.
(PB85-101947/GAR; GRI-84/0141) Avail: NTIS HC A06/MF A01 CSCL 13B

A laboratory technique for pinpointing leaks in a low-pressure (about 0.25 psig) gas line for field use was adapted. The technique consisted of inserting a microphone, into a gas main, which acoustically distinguishes leak sounds from background noise. A microphone carrier was designed, built, and successfully used in a 6-inch-diameter main with entry through a 1.5-inch hole. The carrier was moved over to 100 feet, past services and a siphon drip. Field tests were performed within 4- and 6-inch-diameter cast-iron mains. Leaks could not be detected acoustically. It was not known if that was due to a lack of sound being produced by the leak, or if the noise floor of the microphone was too high. The microphone, positioned inside the main at a service line, also listened to the noises created by gas flowing in the service and by the appliances. These measurements demonstrated that flow noise in service was small enough not to affect the ability to detect leaks. GRA

N85-15928# Stirling Power Systems Corp., Ann Arbor, Mich.
PHASE 1-A DEVELOPMENT KINEMATIC STERLING/RANKINE COMMERCIAL GAS-FIRED HEAT PUMP RESEARCH PROGRAM Annual Report, Aug. 1982 - Aug. 1983
L. Johansson, J. G. Agno, and W. H. Houtman Jul. 1984 71 p refs Sponsored by Gas Research Inst.
(PB85-100931/GAR; GRI-84/0080) Avail: NTIS HC A04/MF A01 CSCL 13A

Heat pumps driven by electric motors are successfully sold as energy saving systems in the space conditioning marketplace. By utilizing an on-site natural gas fueled Stirling cycle engine to drive a refrigerating compressor, energy consumption of such a heat pump can be reduced in both heating and cooling modes of operation. The achievements reached in Phase 1-A indicate that the goal of developing a technically and economically feasible commercial heat pump, using the V-160 Stirling engine, is practical and can be accomplished within a reasonable period of time. This initial investigation also indicates that the potential heat pump system can be responsive to a large market segment as well as providing a technological base for expanding into other gas market segments. Author (GRA)

N85-15929# Joint Publications Research Service, Arlington, Va.
WEST EUROPE REPORT: SCIENCE AND TECHNOLOGY
18 Dec. 1984 57 p Transl. into ENGLISH from various West European articles
(JPRS-WST-84-039) Avail: NTIS HC A04/MF A01

Progress in west-European science and technology is reported. The categories discussed include: advanced materials, aerospace, automobile industry, civil aviation, computers, factory automation, microelectronics, and scientific and industrial policy. For individual titles, see N85-15930 through N85-15934.

N85-15930# Joint Publications Research Service, Arlington, Va.
METHOD FOR FORMING ELECTROMAGNETIC-WAVE-SCREENING COMPOSITE c32
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 1-3 Transl. into ENGLISH from Plastforum Scand. (Stockholm), no. 7-8, 1984 p 54-55 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

A number of ways to give plastic parts the ability to screen out high frequency electromagnetic waves are outlined. Another method which consists of a one stage injection molding process for forming a thermoplastic sandwich whose plastic core, containing metal flakes, is coated with a surface layer of ABS is introduced. The method employs the Battenfeld two component injection molding machine. E.A.K.

N85-15931# Joint Publications Research Service, Arlington, Va.
ALL-COMPOSITE AIRBUS EMPENNAGE Abstract Only c24
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 4 Transl. into ENGLISH from Composites et Nouveaux Mater. (Paris), Sep. 1984 p 6 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

An all-composite Airbus empennage with a framework built entirely out of carbon fibers and epoxy resin in the form of two pre-impregnated fibredux units is discussed. It is suggested that the operating costs of a commercial airplane could be lowered without reducing its flight safety, by using support structures made of high performance composites. With 20% less weight, composite frames should be fully interchangeable with metal frames and meet the same navigability specifications. Their external geometry and attachment points to the fuselage, leading edge, and rudder should therefore be identical to those of metal structures. Moreover, their mass production has to be automated for economic reasons. When these requirements are met, five planes will be equipped with a composite empennage framework for flight tests. E.A.K.

N85-15932# Joint Publications Research Service, Arlington, Va.
COMPOSITE BATTERIES Abstract Only c44
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 4 Transl. into ENGLISH from Composites et Nouveaux Mater. (Paris), Sep. 1984 p 6 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

Lead based composite materials reinforced with mineral fibers which can help improve lead batteries for electric vehicles were examined. A technique which allows impregnation with lead the core of the thousands of strands contained in the fiber tufts was perfected. The impregnation is performed by electrolytic lead deposition following copper plating of the fibers which are not sufficiently conductive. This process is carried out in air at ambient temperature. It can be used with various fibers and allows impregnation of a cloth of mixed carbon and glass fibers to produce negative plates which behave electrochemically like lead, but whose weight is four times lower than that of conventional lead alloy plates. The increase of the rigidity of these composite plates and the production of positive ones is investigated. E.A.K.

N85-15933# Joint Publications Research Service, Arlington, Va.
FIAT, PEUGEOT INTRODUCE INTEGRATED ROBOTIZED ENGINE: CAD USED c37
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 16-19 Transl. into ENGLISH from Il Tempo (Rome), 19 Sep. 1984 p 15 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

The production and manufacturing of a new automobile engine is discussed. The fully integrated robotized engine (FIRE) refers to automatic and robotized production systems. Efficiency in engine assembly and manufacturing is outlined. E.A.K.

N85-15934# Joint Publications Research Service, Arlington, Va.
GALLIUM ARSENIDE COMPOUNDS TESTED NONDESTRUC-

TIVELY WITH X-RAYS c38
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 34-35 Transl. into ENGLISH from Frankfurter Zeitung/Blick Durch Die Wirtschaft (Frankfurt/Main), 8 Oct. 1984 p 7 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

A measuring device which measures by X-ray diffraction small deviations in the periodicity of monocrystals was built. The measurements examine changes produced deliberately in multilayer structures of gallium arsenide compounds. Such structures are also employed in manufacturing laser diodes. The investigations require very narrow and monochromatic X-ray beams, which are obtained by reflecting X-ray radiation in a special manner at perfect monocrystals. E.A.K.

32 COMMUNICATIONS

Includes land and global communications; communications theory; and optical communications.

For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

N85-15935 Department of the Navy, Washington, D. C.
ADAPTIVE PREPROCESSING SYSTEM Patent
B. L. Lewis and F. F. Kretschmer, Jr., inventors (to Navy) Issued 7 Aug. 1984 6 p
(AD-D011327; US-Patent-4,464,768; US-Patent-Appl-SN-580510; US-Patent-Class-375-101) Avail: US Patent and Trademark Office CSCL 09/4

The present invention preprocesses serial data sample sets so that truly independent samples are available for further processing. Samples to be analyzed are delayed and compared in order to isolate both components that are correlated between samples, and components that are uncorreiated between samples. These components provide independent information relating the samples which are used to modify or preprocess incoming data. Author (GRA)

N85-15936 Department of the Air Force, Washington, D.C.
HARDWIRE MISSILE RECEIVER COUPLER Patent
T. A. Milligan, inventor (to Air Force) Issued 14 Aug. 1984 7 p Supersedes AD-D009428
(AD-D011350; US-Patent-4,465,985; US-Patent-Appl-SN-353983; US-Patent-Class-333-116) Avail: US Patent and Trademark Office CSCL 17/2

A hardware missile receiver coupled line apparatus is inserted between the antenna output port and the receiver input in a missile communication link to allow signals to be coupled directly into the missile receiver before the missile launch. At launch, the cable to the side of the missile is pulled from the side of the missile. After the cable is pulled, the open circuited cable between the side of the missile and the coupling network does not degrade the signal transmission from the antenna to the receiver. Author (GRA)

N85-15937 Department of the Navy, Washington, D. C.
ADAPTIVE MTI (MOVING TARGET INDICATOR) SYSTEM Patent
F. F. Kretschmer, Jr., B. L. Lewis, and J. P. Hansen, inventors (to Navy) Issued 10 Jul. 1984 7 p
(AD-D011361; US-Patent-4,459,700; US-Patent-Appl-SN-580395; US-Patent-Class-375-101) Avail: US Patent and Trademark Office CSCL 17/9

This invention relates to improvements in signal processing systems and more particularly to improved techniques for eliminating interference or otherwise undesirable signal components from serial data samples to be processed by Moving Target Indicator type radar system processors. GRA

N85-15938 Department of the Air Force, Washington, D.C.
DIAGNOSTIC APPARATUS FOR RADAR PULSE REPETITION FREQUENCY CONTROL CIRCUIT CARD Patent
T. S. Smith, inventor (to Air Force) Issued 18 Sep. 1984 5 p Supersedes AD-D009251
(AD-D011364; US-Patent-4,472,679; US-Patent-Appl-SN-324907; US-Patent-Class-324-73PC) Avail: US Patent and Trademark Office CSCL 17/9

A portable circuit tester for troubleshooting a multiplier circuit card of the AN/MPS-9 and the AN/MSQ-2 radar systems, particularly when these systems are van mounted is discussed. During normal operation of the circuit tester, the circuit card is completely removed from the equipment console and connected to the test box. The test box circuitry provides the power supply and control selections necessary to operate the circuit card under realistic conditions while also allowing easy access to all components on the circuit card. The output from the test box is fed into one channel of a dual channel oscilloscope, with the input for the other channel coming from a probe connected to the test points on the circuit card being examined. GRA

N85-15939 Department of the Air Force, Washington, D.C.
HOLOGRAPHIC DIRECTIONAL COUPLER FOR FIBER OPTIC SYSTEMS Patent
J. L. Horner and J. E. Ludman, inventors (to Air Force) Issued 14 Aug. 1984 10 p
(AD-D011365; US-Patent-4,465,332; US-Patent-Appl-SN-375622; US-Patent-Class-350-96.19) Avail: US Patent and Trademark Office CSCL 17/2

A fiber optic directional coupler having a holographic element incorporated therein is discussed. A single optical signal impinges on the holographic element and is separated into a plurality of individual signals which are coupled to a plurality of individual optical fibers. Only a fraction of the incident electromagnetic radiation incident on the holographic element is transmitted to any one of the plurality fibers. Reversing the direction of the radiation causes all the energy emanating from the combined plurality of fibers to be coupled to the single receiving fiber. GRA

N85-15940 Department of the Air Force, Washington, D.C.
VOICE COMMAND WEAPONS LAUNCHING SYSTEM Patent
H. E. Brown, inventor (to Air Force) Issued 14 Sep. 1984 7 p Supersedes AD-D009839
(AD-D011378; US-Patent-4,471,683; US-Patent-Appl-SN-411946; US-Patent-Class-89-1A) Avail: US Patent and Trademark Office CSCL 17/2

This abstract discloses a voice-controlled weapons launching system for use by a pilot of an aircraft against a plurality of simultaneously appearing (i.e., existing) targets, such as two or more aggressor aircraft (or tanks, or the like) attacking more aggressor aircraft. The system includes, in combination, a voice controlled input device linked to and controlling a computer; apparatus (such as a television camera, receiver, and display), linked to and actuated by the computer by a voice command from the pilot, for acquiring and displaying an image of the multi-target area; a laser, linked to and actuated by the computer by a voice command from the pilot to point to (and to lock on to) any one of the plurality of targets, with the laser emitting a beam toward the designated (i.e., selected) target; and a plurality of laser beam-rider missiles, with a different missile being launched toward and attacking each different designated target by riding the laser beam to that target. Unlike the prior art, the system allows the pilot to use his hands full-time to fly and to control the aircraft, while also permitting him to launch each different missile in rapid sequence by giving a two-word spoken command after he has visually selected each target of the plurality of targets, thereby making it possible for the pilot of a single defender aircraft to prevail against the plurality of simultaneously attacking aircraft, or tanks, or the like. GRA

N85-15941 Department of the Air Force, Washington, D.C.
EMI (ELECTROMAGNETIC INTERFERENCE) FILTER CAPACITOR UNIT Patent
G. W. Miller and L. L. McClintock, inventors (to Air Force) Issued 7 Aug. 1984 7 p Supersedes AD-D010558
(AD-D011392; US-Patent-4,464,702; US-Patent-Appl-SN-504183;

US-Patent-Class-361-328) Avail: US Patent and Trademark Office CSCL 09/5

The unit comprises several rolled capacitor elements in a single case, with a package concept that allows installation mounting and electrical interconnection on the same top plane. A U-shaped feedthrough bus in the form of a wide metal strip is routed from a top input terminal down the center of the case and up adjacent one wall to a top output terminal. The capacitor elements are in two sets on opposite sides of the center portion of the feedthrough bus, and connected thereto. A ground bus serving as an internal noise partition connected to the metal top is between the capacitor elements of one set and the outer portion of the feedthrough bus. A minimum of three units may be used with the variable speed constant frequency (VSCF) converter of the three-phase power supply system of an aircraft, for filtering and suppression of electromagnetic interference. The construction permits use of two input terminals bussed together, and two output terminals bussed together for handling large currents. Author (GRA)

N85-15942*# National Aeronautics and Space Administration, Washington, D. C.

AXISYMMETRIC ELECTROMAGNETIC FIELD INFLUENCE ON THE CHARACTERISTIC VELOCITY OF AN ARC-JET

Mario Oggero and Dario Gennuso Jul. 1984 21 p refs Transl. into ENGLISH of "Influenza di un campo elettromagnetico assial-simmetrico culla velocita charatteristica di un arcojetto" rept. Publ-154 Turin, Nov. 1973 18 p Previously announced as N74-18404 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by Inst. di Macchine e Motor per Aeromobili, Turin

(Contract NASw-3542)

(NASA-TM-77475; NAS 1.15:77475; Publ-154) Avail: NTIS HC A02/MF A01 CSCL 20N

Tests for determining the influence of an axisymmetric EM field on the characteristic velocity of an arc jet are presented. The experimental set up is briefly described. Tests were performed with rotation induced by the centrifugal and magnetic fields in the same sense. The fuels used were HE and N2 and the results are discussed. It is found that by variation of the induction, current, and arc jet strength, the behavior is determined essentially by the shape of the cathodic and anodic blobs on the electrodes together with their movement under the combined effect of the aerodynamic and magnetic fields. In view of the different characteristics of He and N2 in respect to the dissociation heat and ionization, it is expected that the regime of the arc jet when used with H2 fuel will be similar to that with He. Author

N85-15943*# Illinois Univ., Urbana. Electromagnetic Communication Lab.

MMIC DEVICES FOR ACTIVE PHASED ARRAY ANTENNAS Semiannual Report, 21 May - 20 Dec. 1984

R. Mittra Dec. 1984 17 p refs

(Contract NCC3-38)

(NASA-CR-174281; NAS 1.26:174281) Avail: NTIS HC A02/MF A01 CSCL 20N

The study of printed circuit discontinuities is necessary in order to design, for example, transitions between rectangular waveguides and printed circuits. New developments with respect to the analytical approaches to this problem are discussed. A summary of the progress in the experimental approach is presented. The accurate solution for the modes in various millimeter-wave waveguides is essential in the analysis of many integrated circuit components, such as filters and impedance transformers. Problems associated with the numerical computation of these modes in two frequently used waveguide forms, namely, the finline and microstrip, are presented. The spectral domain method of formulation, with a moment method solution, is considered. This approach can be readily extended to analyze an arbitrary configuration of dielectric and metallized regions in a shielded enclosure. Galerkin's method is used, where the testing and basic functions are the same. It is shown that the mode functions, or eigenfunctions, are more sensitive to errors than the phase constants, or eigenvalues. The approximate mode functions do not satisfy the orthogonality relationship well, resulting in difficulties when these modal solutions are used to form an approximate Green's function or are used in a mode matching analysis. B.W.

N85-15944*# Ford Aerospace and Communications Corp., Palo Alto, Calif.

THE 20 GHz PROOF-OF-CONCEPT TEST MODEL RESULTS FOR A MULTIPLE SCAN BEAM DUAL REFLECTOR ANTENNA

T. Roberts, A. Smoll, H. Luh, E. W. Matthews, and W. G. Scott 1984 15 p Presented at the IEEE Antenna Propagation Symp., Houston, Tex., 23-27 May 1983

(Contract NAS3-22498)

(NASA-CR-174268; NAS 1.26:174268) Avail: NTIS HC A02/MF A01 CSCL 17B

A full scale 20 GHz antenna model was designed, fabricated and tested. The model is intended to test the low sidelobe beam scanning capability of a new class of an offset dual reflector and feed array configuration. The offset main reflector and subreflector surfaces are custom shaped by a computer synthesis procedure. The derived optics result in beam scan loss under 1 db over the + or - 12.3 beamwidths by + or - 5.8 beamwidths scan volume while maintaining low sidelobes. It is found that the measured and computed patterns are in good agreement. E.A.K.

N85-15945# Selenia S.p.A., Rome (Italy).

RIVISTA TECNICA SELENIA, VOLUME 9, NUMBER 1

Adriana Marzi, ed. 1984 39 p refs

Avail: NTIS HC A03/MF A01

Reference oscillator stability effect on clutter cancellation in a radar system; generation of random variables for radar simulation; sputtering thin film technology for optics; and equipment for preflight test of an electronic countermeasures avionic system are discussed. For individual titles, see N85-15946 through N85-15949.

N85-15946# Selenia S.p.A., Rome (Italy). Radar Factory.

REFERENCE OSCILLATOR STABILITY EFFECT ON CLUTTER CANCELLATION IN A RADAR SYSTEM

Sergio Sabatini *In its* Rivista Tec. Selenia, Vol. 9, No. 1 1984 p 1-7 refs (For primary document see N85-15945 07-32)

Avail: NTIS HC A03/MF A01

A model to calculate the improvement value in a video processor consisting of a generic filter with only zeros for radar applications was applied to two oscillators with known characteristics. The maximum value of improvement attainable does not depend on the frequency response of the processor, nor on the behavior of the nonuniform part of the oscillator's spectrum. It is limited by the uniform level of the spectrum. Improvement values obtained from a clutter with nonideal characteristics depend on the processor. The improvement calculation was carried out starting from the spectrum (in the frequency domain). It can also be carried out in the time variable domain, by using directly the autocorrelation function. The choice made takes into account the fact that the characteristics of the oscillators are often defined in terms of the spectrum, rather than autocorrelation function. Author (ESA)

N85-15947# Selenia S.p.A., Rome (Italy). Radar Dept.

ON THE GENERATION OF RANDOM VARIABLES FOR RADAR SIMULATION PURPOSES

Gaspare Galati and Stefano Fanelli (L'Aquila Univ., Italy) *In its* Rivista Tec. Selenia, Vol. 9, No. 1 1984 p 8-18 refs (For primary document see N85-15945 07-32)

Avail: NTIS HC A03/MF A01

The uniform pseudorandom number generator, available in the subroutine FORTRAN RANDN/FG UNIVAC for 36 bit computers such as the UNIVAC 1100 series, underwent statistical tests. The pure congruence generator performs particularly well. Using these uniform numbers, it is easy to obtain pseudorandom numbers distributed with the laws of practical interest for digital simulations. With the Gaussian law, it is possible to use the central limit theorem and the Box-Muller method. Subroutines for these methods require between 0.6 and 0.15 msec. Author (ESA)

N85-15948# Selenia S.p.A., Rome (Italy). Research Dept.
SPUTTERING IN THIN FILM TECHNOLOGY FOR OPTICS
Carlo Misiano, Mauro Varasi, Calisto Mancini, Paolo Sartori, and Luigi Lasaponara *In its* Rivista Tec. Selenia, Vol. 9, No. 1 1984 p 19-27 refs (For primary document see N85-15945 07-32)
Avail: NTIS HC A03/MF A01

Cosputtering of thin films for optics RF-diode sources; trimming the thickness of optical films by sputter etching; RF sputtering of oxides for IR applications; and deposition of optical films by ion beam sputtering are discussed. Cosputtering enables deposition with a high degree of controllability and reproducibility of films with predetermined refractive indices with value between the two initial bulk materials. Depositing by sputtering films of Y2O3, TiO2HfO2, CeO2 and SiO2 for applications in the IR field yields films with high stability and resistance to surrounding stresses. The refractive index, adsorption, and radiation damage threshold for pulsed and CW lasers (1.06 and 10.6 microns) are reported.
Author (ESA)

N85-15949# Selenia S.p.A., Rome (Italy). Special System Design Dept.
EQUIPMENT FOR PREFLIGHT TEST OF AN ELECTRONIC COUNTERMEASURES (ECM) AVIONIC SYSTEM
Vincenzo Buontempo *In its* Rivista Tec. Selenia, Vol. 9, No. 1 1984 p 28-36 refs (For primary document see N85-15945 07-32)
Avail: NTIS HC A03/MF A01

Equipment used for the logistic support of the first level of maintenance of an ECM system is described. Design aspects such as mean time to repair and testability which give appreciable benefits to the readiness for the mission of the ECM system and the strike aircraft which carries it are outlined. Author (ESA)

N85-15950# Naval Ocean Systems Center, San Diego, Calif.
VOTAN V5000 SPEECH RECOGNITION SYSTEM PERFORMANCE TEST REPORT Final Report, Mar. - May 1984
W. J. Fitzgerald Aug. 1984 11 p
(AD-A146726; NOSC/TD-740) Avail: NTIS HC A02/MF A01 CSCL 17/2

Evaluation of speech recognition equipment in both quiet office and noisy environments is necessary for such projects as the Low Data Rate Voice Terminal System (LDRVTS), which rely heavily on speech recognition technology for their implementation. To keep abreast of the current state of this changing technology, the VOTAN V5000 system is evaluated in this report. The selection of the VOTAN system for evaluation was influenced by a report in an article from the September/October 1982 issue of Speech Technology, a trade magazine, which described encouraging noise test results with the VOTAN unit in a NASA evaluation test. GRA

N85-15951# Computer Sciences Corp., Silver Spring, Md. System Sciences Div.
SUPPORT FOR THE NAVAL RESEARCH LABORATORY PASSIVE MICROWAVE CLUTTER ANALYSIS PROGRAM Final Contractor Report
T. J. Griffin Oct. 1984 32 p
(Contract N00014-83-C-2316)
(AD-A146771; CSC/TR-84/6005) Avail: NTIS HC A03/MF A01 CSCL 17/9

This document summarizes the data acquisition, reduction, and processing support CSC provided Code 7911 of the Naval Research Laboratory (NRL) under contract N00014-83-C-2316. The support for the NRL Passive Microwave Clutter Program included development of algorithms for processing and analyzing data obtained by a ground-based microwave radiometer observing thermal radiation from various targets. Data reduction and analysis techniques are discussed. Author (GRA)

N85-15952# Aerospace Corp., El Segundo, Calif. Aerophysics Lab.
REVERSE WAVE SUPPRESSION IN UNSTABLE RING RESONATOR
H. Mirels, R. A. Chodzko, J. M. Bernard, R. R. Giedt, and J. G. Coffer Los Angeles Air Force Space Div. 15 Aug. 1984 40 p
(Contract F04701-83-C-0084)
(AD-A146825; TR-0084(4764)-3; SD-TR-84-36) Avail: NTIS HC A03/MF A01 CSCL 20/14

The effectiveness of a reverse wave suppressor mirror in unstable linear and annular ring resonators was investigated theoretically and experimentally for the case of an inhomogeneously broadened gain medium. GRA

N85-15953# Georgia Inst. of Tech., Atlanta. School of Electrical Engineering.
TWO-DIMENSIONAL SIGNAL PROCESSING AND STORAGE AND THEORY AND APPLICATIONS OF ELECTROMAGNETIC MEASUREMENTS. SUPPLEMENTAL APPENDIX Annual Report, 1 Apr. 1983 - 31 Mar. 1984
R. W. Schafer and D. T. Paris Jun. 1984 595 p
(Contract DAAG29-81-K-0024)
(AD-A146848; ARO-17962.50-EL) Avail: NTIS HC A25/MF A01 CSCL 09/1

This is a supplement to the annual report on research under the auspices of the Joint Services Electronics Program. The supplement consists of a printed table of contents and a set of microfiche containing all papers and theses produced under this contract. Specific topics covered are: digital signal processing, parallel processing architectures, two-dimensional optical storage and processing, hybrid optical/digital signal processing, electromagnetic measurements in time domain, and automatic radiation measurements for near-field and far-field transformations.
Author (GRA)

N85-15954# Human Engineering Labs., Aberdeen Proving Ground, Md.
LITERATURE REVIEW OF VOICE RECOGNITION AND GENERATION TECHNOLOGY FOR ARMY HELICOPTER APPLICATIONS Final Report
K. A. Christ Aug. 1984 27 p
(AD-A146878; HEL-TN-11-84) Avail: NTIS HC A03/MF A01 CSCL 17/2

This report is a literature review on the topics of voice recognition and generation. Areas covered are: manual versus vocal data input, vocabulary, stress and workload, noise, protective masks, feedback, and voice warning systems. Results of the studies presented in this report indicate that voice data entry has less of an impact on a pilot's flight performance, during low-level flying and other difficult missions, than manual data entry. However, the stress resulting from such missions may cause the pilot's voice to change, reducing the recognition accuracy of the system. The noise present in helicopter cockpits also causes the recognition accuracy to decrease. Noise-cancelling devices are being developed and improved upon to increase the recognition performance in noisy environments. Future research in the fields of voice recognition and generation should be conducted in the areas of stress and workload, vocabulary, and the types of voice generation best suited for the helicopter cockpit. Also, specific tasks should be studied to determine whether voice recognition and generation can be effectively applied. GRA

N85-15955# Naval Research Lab., Washington, D. C.
RADAR ECHO ENHANCEMENT USING SURFACE REFLECTIONS Interim Report
B. H. Cantrell 28 Sep. 1984 10 p
(AD-A146970; NRL-8849) Avail: NTIS HC A02/MF A01 CSCL 17/9

Analysis and simulation have shown that the detection of targets by pencil-beam radars could be enhanced by using strong surface reflections which are sometimes present. The radar used a beam pointed at the target and a beam pointed at the target reflection on the surface. Transmitting only on the direct beam and simultaneously receiving the direct and reflected beam energy, up to 2.5 dB improvement in signal-to-noise ratio (S/N) was obtained. During strong reflecting conditions, transmitting and receiving simultaneously over both beams made up to 5.5 dB improvement in S/Ns, but the improvement and occasional loss depended heavily on the target location within the beam. GRA

N85-15956# Naval Research Lab., Washington, D. C. Electromagnetics Branch.
ARRAY SIDELOBES, ERROR TOLERANCE, GAIN, AND BEAMWIDTH Interim Report
James K. Hsiao 28 Sep. 1984 17 p
(AD-A147004; NRL-8841) Avail: NTIS HC A02/MF A01 CSCL 09/5

In this report, we present a set of universal probability curves that the array error tolerance, illumination function, achievable sidelobe level, and the designed sidelobe level. We show that this set of probability curves can be used to find a lower designed sidelobe level to achieve a better error tolerance. The relations of array directivity gain and beamwidth with respect to illumination function are also discussed. These parameters can be conveniently used for this design procedure without detailed knowledge of the array illumination. Originator supplied keywords include: antenna, phased array, and array errors. GRA

N85-15957# Naval Research Lab., Washington, D. C. Communication Systems Engineering Branch.
DISTRIBUTED RESERVATION-BASED CODE DIVISION MULTIPLE ACCESS
J. E. Wieselthier and A. Ephremides (Maryland Univ., College Park) 2 Nov. 1984 23 p
(AD-A147007; NRL-MR-5446) Avail: NTIS HC A02/MF A01 CSCL 17/2

The use of spread spectrum signaling, motivated primarily by its antijamming capabilities in military applications, leads naturally to the use of Code Division Multiple Access (CDMA) techniques that permit the successful simultaneous transmission by a number of users over a wideband channel. In this paper we address some of the major issues that are associated with the design of multiple access protocols for spread spectrum networks. We then propose, analyze, and evaluate a distributed reservation-based multiple access protocol that does in fact exploit CDMA properties. Especially significant is the fact that no acknowledgment or feedback information from the destination is required (thus facilitating communication with a radio-silent mode), nor is any form of coordination among the users necessary. GRA

N85-15958# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
PULSE TRANSMISSION THROUGH FROZEN SILT
S. A. Arcone Jul. 1984 14 p
(AD-A147108; CRREL-84-17) Avail: NTIS HC A02/MF A01 CSCL 20/14

An important objective of geophysical exploration in permafrost regions is the delineation of subsurface ground ice. Recent studies have reported on the use of ground-penetrating radar to detect massive ground ice. VHF-band radiowave short pulses were transmitted within the permafrost tunnel at Fox, Alaska, over distances between 2.2 and 10.5 m. The propagation medium was a frozen silt containing both disseminated and massive ice with temperatures varying from -7 C near the transmitter to probably -2 C near the center of the tunnel overburden. The short pulses underwent practically no dispersion in the coldest zones but did disperse and refract through the warmer overburden, as suggested by calculations of the effective dielectric constant. Most significantly the measured frequency content decreased as the effective dielectric constant increased. The results indicate that deep, cross-borehole pulse transmissions over distances greater than 10 m might be possible, especially when the ground is no warmer than -4 C. The information thus gained could be used for identifying major subsurface variations, including ground ice features. GRA

N85-15959# Stanford Univ., Calif. Information Systems Lab.
STUDIES IN STATISTICAL SIGNAL PROCESSING Annual Scientific Report, 1 Jul. 1983 - 30 Jun. 1984
T. Kailath 28 Aug. 1984 9 p
(Grant AF-AFOSR-0228-83)
(AD-A147130; AFOSR-84-0868TR) Avail: NTIS HC A02/MF A01 CSCL 17/2

Several new results in the modeling, analysis and prediction of nonstationary second order processes have been developed. They include: (1) the derivation of constant-parameter lattice filters for general nonstationary processes; (2) the development of fast algorithms for adaptive filtering with fixed-order transversal filters, including modifications necessary to ensure stability and convergence with finite precision computations; (3) the invention of a new adaptive beam-forming array for separating coherent (completely correlated) signals and interference. Two Ph.D theses have been completed during this period, H. Lev-Ari, 'Nonstationary Lattice-Filter Modeling, December 1983, and J. M. Cioffi, Fast Transversal Filters for Communications Applications, March 1984. GRA

N85-15960# Kansas Univ. Center for Research, Inc., Lawrence. Remote Sensing Lab.
INTERMEDIATE RESULTS OF RADAR BACKSCATTER MEASUREMENTS FROM SUMMER SEA ICE
S. Gogineni, R. G. Onstott, R. K. Moore, and J. Chancellor Jul. 1984 51 p
(Contract N00014-76-C-1105)
(AD-A147212; RSL-TR-3311-2) Avail: NTIS HC A04/MF A01 CSCL 20/14

A helicopter-borne scatterometer (HELOSCAT) was used to measure radar backscatter from sea ice under summer conditions near Mould Bay, N.W.T., Canada, in June and July 1982. These measurements were made at selected frequencies between 1 and 17 GHz, and at angles between 5 deg and 60 deg with like and cross-polarizations. Multiyear ice (MYI) can be distinguished form first-year ice (FYI) using the profiles acquired by flying the helicopter along selected scan lines at 5.2, 9.6 and 13.6 GHz during early and late summer. Because of wet snow and ice on the surface, producing reduced volume scatter, there is lower backscatter from MYI during summer that during winter. Because of superimposed ice, the backscatter from FYI during early summer is slightly higher than that during other seasons. Its backscatter is higher than that of MYI for the early part of summer, but as summer progresses, FYI backscatter reduces and eventually becomes lower than that from MYI. Results indicate that higher frequencies in Ku- and X-bands are not better than lower frequencies in C-band for discriminating basis ice types during summer. Backscatter from MYI and FYI increased with frequency, and the contrast between FYI and MYI increased with decreasing frequency during late summer. GRA

N85-15961# Rome Air Development Center, Griffiss AFB, N.Y.
DUAL OFFSET REFLECTOR ANTENNA SYSTEMS WITH ROTATIONALLY SYMMETRIC APERTURE DISTRIBUTIONS
R. A. Shore and C. J. Sletten Jun. 1984 39 p
(DA Proj. 230-5)
(AD-A147346; RADC-TR-84-140) Avail: NTIS HC A03/MF A01 CSCL 09/5

A detailed derivation is given of the basic design equation for a dual offset reflector antenna consisting of a paraboloid main reflector and a confocal/hyperboloid or ellipsoid subreflector. The basic design equation is a relation between the subreflector eccentricity; the relative orientations of the axes of the main reflector, subreflector, and feed; and the paraboloid focal length. If satisfied, the basic design equation guarantees that (to within the geometric optics approximation) a circularly symmetric and linearly polarized feed pattern will give rise to a circularly symmetric and linearly polarized main aperture distribution and far field pattern. The relation between the amplitude distribution of the feed pattern and main aperture is also derived. GRA

N85-15962# Rome Air Development Center, Griffiss AFB, N.Y.
EFFICIENT COMPUTATION OF REFLECTOR ANTENNA APERTURE DISTRIBUTIONS AND FAR FIELD PATTERNS
H. Steyskal and R. A. Shore Mar. 1984 47 p
(AF Proj. 2305)
(AD-A147367; AD-F300486; RADC-TR-84-45) Avail: NTIS HC A03/MF A01 CSCL 09/5

A computationally efficient method is presented for calculating the aperture distribution and the far field pattern of a parabolic

reflector with an off-axis array feed. Idealized, uncoupled array elements and realistic, mutually coupled, circular waveguide elements are considered. Ray optics are used to determine the scalar aperture field over a rectangular grid of aperture sampling points. Two alternative methods for performing the aperture integration required for the pattern evaluation are compared: (1) based on summation of subapertures with constant amplitude/linear phase, and (2) based on the Fast Fourier Transform (FFT) and sampling theory. Patterns obtained with this method are compared with independency computed patterns that use other approaches. The range of validity of the aperture field integration method is discussed. GRA

N85-15963# Kansas Univ. Center for Research, Inc., Lawrence. Remote Sensing Lab.
DESIGN OF AN ANALOG SPECTRUM ANALYZER FOR PROBING EXPERIMENTS
R. Zoughi, R. K. Moore, and R. G. Onstott Jul. 1984 57 p
(Contract N00014-76-C-1105)
(AD-A147384; CRINC/RSL-TR-3311-1) Avail: NTIS HC A04/MF A01 CSCL 17/9

A spectrum analyzer is required for analyzing the signal received by an FM-CW radar and for probing the ground and sea ice with an FM radar. Logistics and economic considerations limit the kind of spectrum analyzer used. These limitations suggest the need for a simple, yet adequate and portable, spectrum analyzer. Hence, a spectrum analyzer was specified, designed and developed to serve these purposes. This report briefly introduces the kind of radar used for these probing experiments and extensively describes the design and performance of this special-purpose spectrum analyzer. GRA

N85-15964# General Electric Co., Schenectady, N. Y.
CHARGE DOMAIN FILTERS FOR ENHANCED MONOLITHIC SIGNAL PROCESSING Final Report, Sep. 1980 - Jun. 1983
J. Tiemann, T. Vogelsong, A. Steckl, and S. Bencuya Griffiss AFB, N.Y. RADC Aug. 1984 111 p
(Contract F19628-80-C-0213; ARPA Order 4016)
(AD-A147428; SRD-83-065; RADC-TR-84-160) Avail: NTIS HC A06/MF A01 CSCL 17/2

The Charge Domain Device (CDD) concept in sampled analog signal processing on a chip was investigated both theoretically and experimentally. The basic operations required for signal processing functions were evaluated, and new structures were discovered which yield an improved level of design flexibility. The physical limitations of the charge domain approach and their effect on overall device performance were determined. In addition to numerous test structures, which were fabricated to evaluate new and improved device structures, design methodologies and tools useful for both mathematical design and structural optimization were developed. An 8-pole narrowband bandpass filter has been designed, fabricated and tested in order to demonstrate the wide range of capabilities of charge domain devices. The experimental characteristics of a filter having a bandwidth of 1/100 of the clocking frequency and over 65 dB passband-to-stopband ratio exemplify these characteristics and verify the utility of the design tools for the program. GRA

N85-15965# Naval Research Lab., Washington, D. C.
SYNOPTIC OBSERVATIONS OF THE RADIO NOISE BACKGROUND IN THE FREQUENCY RANGE 150-180 kHz TO PROVIDE DESIGN DATA FOR THE LOW FREQUENCY COMMUNICATIONS DESIGNER Final Report
S. H. Knowles, F. J. Kelly, S. Odenwald (Sachs/Freeman Associates, Inc., Bowie, Md.), and W. B. Waltman 28 Sep. 1984 83 p
(RR0-3406)
(AD-A147438; NRL-MR-5360) Avail: NTIS HC A05/MF A01 CSCL 17/2

Observations were made of the radio noise background in the frequency range 150-180 kHz to provide reference data for the design of the Ground Wave Emergency Network (GWEN) system. These observations were undertaken at Nanjemoy, Maryland, during early summer 1983, and included forty-one days of data recording. The noise environment was found to be dominated by impulsive thunderstorm noise. Preliminary data analysis is presented; the recorded data is available on magnetic tape for authorized users to use for system design purposes. GRA

N85-15966# Aerospace Corp., El Segundo, Calif. Electronics Research Lab.
A QUASI-OPTICAL METHOD FOR MEASURING THE COMPLEX PERMITTIVITY OF MATERIALS
F. I. Shimabukuro, S. Lazar, H. D. Dyson, and M. R. Chernick 1 Sep. 1984 41 p
(Contract F04701-83-C-0084)
(AD-A147483; TR-0084(4925-07)-1; SD-TR-84-43) Avail: NTIS HC A03/MF A01 CSCL 20/4

A quasi-optical method for measuring the complex permittivity of materials is described. The determination is derived from measurements of the transmission of a perpendicularly polarized wave through a dielectric slab at different angles of incidence. This relatively simple method is quite sensitive and accurate estimates of the relative permittivity and the loss tangent can be obtained by accurately measuring the frequency of the signal and by the use of large, precisely machined Fabry-Perot plates. Estimates of the standard errors in the determination are obtained by using a bootstrap resampling technique. The measurements here were made at a frequency of 93.788 GHz at ambient temperature. Author (GRA)

N85-15967# Naval Research Lab., Washington, D. C.
RADAR FREQUENCY SELECTION STRATEGIES Interim Report, Nov. 1983 - Mar. 1984
B. H. Cantrell and G. V. Trunk 28 Sep. 1984 14 p
(AD-A147493; AD-F300490; NRL-8843) Avail: NTIS HC A02/MF A01 CSCL 17/9

Strategies for improving the radar detection of weak targets are examined. These strategies are based on transmitting a few pulses, selecting a frequency which obtains the highest signal-to-noise ratio (S/N) on a fluctuating target whose position is not exactly known, and transmitting the remaining pulses during mainbeam illumination at that frequency. Some improvement over random frequency selection is obtained on the selected target while a small degradation occurs for other targets located in the beam. Author (GRA)

N85-15968# Avelex, Silver Spring, Md.
NEW TECHNOLOGY HIGH EFFICIENCY AND HIGH STABILITY COLOR MOTION VIDEO COMPRESSION SYSTEM Final Report
15 Aug. 1984 20 p
(Contract N00014-84-C-0676)
(AD-A147523) Avail: NTIS HC A02/MF A01 CSCL 17/2

New video signal compression technology including a novel mathematical transform was previously developed by Avelex to provide for low bit rate transmission of full motion monochrome imagery. The nature of this new technology has suggested that chrominance might be added to provide full color imagery with a rather small increase in the bit rate required for transmission above that required for the monochrome transmission alone. The subject task was proposed to DARPA to demonstrate the feasibility of a full color, full motion video compression system which could be used for Defense Department and other Government Agencies, as well as commercial applications. Two signal processing techniques were proposed for the DARPA work which have been implemented and experimentally evaluated with successful outcomes, and the results herein reported. Additionally, a Videotape showing the experimental results is submitted as auxiliary information to this final report. GRA

N85-15969# Washington Univ., Seattle. Dept. of Electrical Engineering.
MULTIPLE SCATTERING EFFECTS ON TRANSMISSION THROUGH THE ATMOSPHERE Final Report, 1 Sep. 1978 - 31 Aug. 1984
A. Ishimaru Nov. 1984 9 p

(Contract N00014-78-C-0723)
(AD-A147527) Avail: NTIS HC A02/MF A01 CSCL 20/6

The work is directed to the investigation of the transmission characteristics of optical waves with wavelengths in the range of 1-15 micrometers through various atmospheric conditions including clouds, fog, turbulence, rain, hail, snow, and inhomogeneous layers. GRA

N85-15970# Department of the Air Force, Washington, D.C.
PARALLEL PROCESSOR CONFIGURATION FOR ADAPTIVE ANTENNA ARRAYS Patent Application
A. I. Wiener, inventor (to Air Force) Filed 15 Aug. 1984 52 p
(AD-D011347; US-Patent-Appl-SN-640904) Avail: NTIS HC A04/MF A01 CSCL 17/4

A signal processing system, which operates in parallel with the outputs of sensors of an adaptive array, for quickly nulling multiple jammers is discussed. The processing system includes a set of parallel combiners and an apparatus for updating a signal weight which is applied to the sensor outputs. The parallel combiners mix a weighing function with each sensor output and provide a resultant output signal which has been cleared of interference from jamming. Part of the resultant signal is fed to the apparatus for updating the signal weighing function for further mixing with sensor outputs. The parallel operation of the combiners with each sensor output provides fast nulling effects.
Author (GRA)

N85-15971# Department of the Air Force, Washington, D.C.
TRACKING SERVO COMPENSATOR WITH RATE AIDING Patent Application
B. E. Burkett, inventor (to Air Force) Filed 15 Aug. 1984 28 p
(AD-D011372; US-Patent-Appl-SN-640902) Avail: NTIS HC A03/MF A01 CSCL 17/9

A tracking servo compensator is disclosed for radar systems which steer their antenna beams using a servomechanism that physically moves the antenna. The disclosed tracking servo compensator permits switching between trackers (e.g., from area to point track) and from one tracked target to another without undesirable transients that could cause loss of track. Rate aiding and target range estimates are provided when tracker base motion is known. The compensator works by providing a servo signal that continually monitors the error in estimated track point line-of-sight angular velocity independent of which tracker is employed or the target being tracked. When base motion is known, this signal is used to update the target range estimate so that an accurate rate aiding signal is available. The servo provides smooth controlled-speed transitions between track points during mode switching, and provides an input for manual slewing of the tracker platform offset track conditions. It also provides an estimate of platform to track point range. Author (GRA)

N85-15972# Rome Air Development Center, Griffiss AFB, N.Y. Antennas and RF Components Branch.
A LOW-SIDELOBE SPACE FEED LENS
Daniel T. McGrath May 1984 39 p
(AF Proj. 4600)
(AD-A147883; RADC-TR-84-116) Avail: NTIS HC A03/MF A01 CSCL 09/5

A parallel-plate waveguide microwave lens, constructed as part of the concept development of completely overlapped subarray antennas, was modified and tested. The lens function is comparable to that of a Rotman lens with 16 inputs (bma ports) and 60 outputs (antenna ports). However, the input face is linear with uniformly spaced monopole elements, and the output face is circular, with monopole elements spaced uniformly in angle. Using a four-way power divider at the center four inputs and the outputs connected to a line-source array, low sidelobe patterns were measured over a 22 percent bandwidth. Over the same 8.0 to 10.0 GHz band, total power loss in the lens was between 0.3 and 1.3 dB including mismatch, spillover and reflection losses. GRA

N85-15973# Forschungsinstitut der Deutschen Bundespost, Darmstadt (West Germany).
IMPROVED DIGITAL BASEBAND TRANSMISSION BY APPLICATION OF MAXIMUM LIKELIHOOD DECODING TO AN 8-LEVEL SIGNAL GENERATED BY CONVOLUTION AND BLOCK CODING
Guenter Morgenstern Feb. 1984 66 p refs In GERMAN; ENGLISH summary
(FI-44-TBr-93) Avail: NTIS HC A04/MF A01

To reduce the required signal-to-noise power ratio without increasing the small error rate when transmitting over a channel with additive Gaussian noise, the binary signal to be transmitted is coded by convolution in a redundant binary signal and then block-coded in an eight-level signal. This signal is then decoded in the receiver by the maximum likelihood procedure. The expected error rate is calculated and compared with the quaternary transmission without redundancy. The result of a computer simulation of this transmission procedure is plotted. According to this plot, the required power ratio of peak signal and noise, compared to the quaternary redundancy-free transmission, can be reduced by 1.5 dB at the same error rate. Author (ESA)

N85-15974# Forschungsinstitut der Deutschen Bundespost, Darmstadt (West Germany).
COMPOSITORY SPEECH OUTPUT (KOSA) WITH A VERY LARGE SCALE INTEGRATION SPEECH SYNTHESIS CHIP [KOMPOSITORISCHE SPRACHAUSGABE (KOSA) MIT EINEM VLSI-SPRACHSYNTHESEBAUSTEIN]
H.-J. Braun, K. Mange, and G. Ulbrich May 1984 37 p refs In GERMAN; ENGLISH summary
(FI-13-TBr-18) Avail: NTIS HC A03/MF A01

A speech-output device (KOSA) with linear prediction coding chips was developed. Theoretical foundations and practical problems with data preparation and testing of the device are discussed. The device can be used in on-line operation for development and optimization of text elements, and in off-line operation as speech-output system with an average to high vocabulary. The quality is lower than that of PCM-systems, but this is tolerable for most applications, given the cost. Author (ESA)

N85-15975# Research Inst. of National Defence, Linkoeping (Sweden). Dept. 3.
MODERN SIGNAL PROCESSING AND RECONNAISSANCE
Rolf Helgodt, Goesta Lemme (ERA), and Bjoern Rosen (Material Administration of Armed Forces) Oct. 1984 103 p refs Partly in SWEDISH and ENGLISH Presented at 27th SPIE Intern. Symp., San Diego, Calif., 19 Aug. - 9 Sep. 1983
(FOA-C-30374-E1; ISSN-0347-3708) Avail: NTIS HC A06/MF A01; Research Institute of National Defence, Stockholm KR 50

Systolic arrays, matrix data flow language, electro-optical image sensors, remote sensing, signal processing algorithms for digital image processing, optical signal processing, image analysis, biologically active peptides, camera sets, high angular resolution, governement communication systems, speed of typical operations, roles of photographic and electro-optic imaging sensors in reconnaissance, aircraft and airborne video data recording are discussed. Author (ESA)

N85-15976# National Oceanic and Atmospheric Administration, Miami, Fla. Office of Aircraft Operations.
NOAA (NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION) AIRCRAFT SATELLITE DATA LINK (ASDL)
John R. Parrish, Evan R. Darby, James D. DuGranrut, and Alan S. Goldstein May 1984 40 p refs
(PB84-243773; NOAA/TM-OAO-3; NOAA-84062502) Avail: NTIS HC A03/MF A01 CSCL 17B

The NOAA Aircraft Satellite Data Link (ASDL) is described, includes the data routing, aircraft system and one minute data explanations, types of messages, and radar image transmission. An aircraft ASDL operator's guide with examples of specific message formats are presented. GRA

N85-15977# National Bureau of Standards, Boulder, Colo. Electromagnetic Fields Div.

NBS (NATIONAL BUREAU OF STANDARDS) AND WR62 AND WR90 REFERENCE NOISE STANDARDS Final Report
C. K. S. Miller and W. C. Daywitt May 1984 25 p refs
(PB84-235704; NBSIR-84/3005) Avail: NTIS HC A02/MF A01 CSCL 14B

The basis for the National Bureau of Standards (NBS) WR90 and WR62 Waveguide Reference Noise Standards and the corresponding error analyses are described. The standards are heated (1270 K) thermal noise generators, and a derivation of their output noise temperature equations is also presented. Results of comparisons of the NBS WR90 standard with those of Sweden, England, Australia, and Japan are included. GRA

N85-15930# Joint Publications Research Service, Arlington, Va.
METHOD FOR FORMING ELECTROMAGNETIC-WAVE-SCREENING COMPOSITE
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 1-3 Transl. into ENGLISH from Plastforum Scand. (Stockholm), no. 7-8, 1984 p 54-55 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

N85-16015# Joint Publications Research Service, Arlington, Va.
INTRINSIC POLARIZATION BASIS OF RADAR TARGET OBSERVED BY SYSTEM EMPLOYING DIVERSITY RECEPTION Abstract Only
Ye. L. Kazakov and Yu. M. Shishkin *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 2 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 77-81 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

N85-16017# Joint Publications Research Service, Arlington, Va.
ESTIMATION OF REQUIREMENTS FOR ACCEPTABLE NOISE RADIATION LEVEL OF COMMUNICATION TRANSMITTERS Abstract Only
I. A. Burkov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 13-14 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 34-36 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

N85-16018# Joint Publications Research Service, Arlington, Va.
FORMATION OF RADIO SIGNALS WITH LOW OUT-OF-BAND RADIATION Abstract Only
K. V. Filatov and Yud. O. Pokrovskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 14 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 8-11 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

N85-16019# Joint Publications Research Service, Arlington, Va.
DIGITAL SIGNAL DEMODULATORS WITH SINGLE-SIDEBAND Abstract Only
E. A. Akchurin *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 19 Transl. into ENGLISH from Radiotekh. (Moscow), no. 6, Jun. 1984 p 3-9 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

N85-16029# Joint Publications Research Service, Arlington, Va.
USE OF SHANKS TRANSFORMATION FOR SPEEDING UP ADAPTATION PROCESS IN ANTENNA ARRAYS Abstract Only
I. V. Grubrin, O. I. Zaroshchinskiy, and V. I. Simoylenko *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 6 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 33-37 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16030# Joint Publications Research Service, Arlington, Va.
ANALYSIS OF THRESHOLD EFFECTS DURING ESTIMATION OF ARRIVAL TIME OF OPTICAL SIGNALS Abstract Only
A. P. Trifonov and Ye. P. Yenina *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 7 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 38-42 Original language document previously announced in IAA as A84-37106 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16031# Joint Publications Research Service, Arlington, Va.
ANALYSIS OF EFFECTIVENESS OF PARTIAL OPTIMIZATION OF SPATIAL PROCESSING SYSTEMS Abstract Only
Yu. I. Abramovich, L. A. Gurkina, and B. G. Danilov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 8 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1105-1109 Original language document previously announced in IAA as A84-41313 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16032# Joint Publications Research Service, Arlington, Va.
POTENTIAL EFFECTIVENESS OF SPATIAL PROCESSING IN DETECTING SIGNALS AGAINST BACKGROUND OF INTERFERING REFLECTIONS Abstract Only
V. S. Chernyak *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 9 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1110-1119 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16033# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF ROW-AND-COLUMN CONTROL PRINCIPLE OF PHASE ANTENNA ARRAY FROM AMPLITUDE-PHASE DISTRIBUTION OF FIELD IN APERTURE Abstract Only
V. I. Kolodnikov and L. B. Tartakovskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 9 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1120-1124 Original language document previously announced in IAA as A84-41315 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16035# Joint Publications Research Service, Arlington, Va.
STRUCTURE OF FREQUENCY MODULATED AND PHASE-SHIFT KEYED SIGNALS REFLECTED FROM IONOSPHERE AT NEAR-CRITICAL FREQUENCIES Abstract Only
S. A. Namazov, Yu. I. Orlov, and N. N. Fedorov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 11 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1009-1016 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16036# Joint Publications Research Service, Arlington, Va.
DISPERSION PROPERTIES OF MOVING IONOSPHERIC PERTURBATIONS Abstract Only
G. I. Grigoryev and N. G. Denisov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 11 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 1073-1075 Original language document previously announced in IAA as A85-11811 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16037# Joint Publications Research Service, Arlington, Va.
INFLUENCE OF FARADAY EFFECT IN IONOSPHERE ON NONMUTUALITY OF METEOR RADIO CHANNEL Abstract Only
V. V. Sidorov, R. G. Khuzyashev, and A. N. Fisukhov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 12 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 1075-1077 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16041# Joint Publications Research Service, Arlington, Va.
TOLERANCE SYNTHESIS OF MULTILAYER RADOME WALLS Abstract Only
L. B. Lerman, P. P. Skurskiy, and T. V. Shumilo *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 26 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 82-84 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16052# Joint Publications Research Service, Arlington, Va.
REAL-TIME ANALYSIS OF SPACE CHARACTERISTICS OF MICROWAVE ELECTROMAGNETIC PULSE FIELDS BY MEANS OF CONTROLLABLE LAYER STRUCTURES Abstract Only
V. P. Dudkin and Yu. S. Obtemperanskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 63 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 43-47 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16344*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
UPSET SUSCEPTIBILITY STUDY EMPLOYING CIRCUIT ANALYSIS AND DIGITAL SIMULATION
Victor A. Carreno *In its* Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 14 p refs Previously announced as N84-27374 (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

N85-16345*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DATA AND RESULTS OF A LABORATORY INVESTIGATION OF MICROPROCESSOR UPSET CAUSED BY SIMULATED LIGHTNING-INDUCED ANALOG TRANSIENTS
Celeste M. Belcastro *In its* Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 12 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

N85-16349*# Electro Magnetic Applications, Inc., Denver, Colo.
A COMPARISON OF LIGHTNING AND NUCLEAR ELECTROMAGNETIC PULSE RESPONSE OF A HELICOPTER
C. C. Easterbrook and R. A. Perala *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 7 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

N85-16350*# Electro Magnetic Applications, Inc., Denver, Colo.
A COMPARISON OF LIGHTNING AND NUCLEAR ELECTROMAGNETIC PULSE RESPONSE OF TACTICAL SHELTERS
R. A. Perala, T. H. Rudolph, and P. M. McKenna *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 12 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

N85-16710# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
LIMITATION OF VLBI ANGULAR RESOLUTION
L. I. Matveyenko *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 119-121 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

33 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics.*

N85-15978 British Library Lending Div., Boston Spa (England).
TEST YOUR CONTACTS BY MEASURING THEIR CONSTRICTION RESISTANCE
24 Sep. 1984 19 p Transl. into ENGLISH from Measures - Regulation - Automatisme (France), Jun.-Jul. 1982 p 57-66 (BLL-WH-611-(9091.9F)) Copyright. Avail: British Library Lending Div., Boston Spa, England

The theory of constriction and the laws governing the voltage and current are presented, and the rise in temperature resulting from the passage of the current through a contact is indicated. A method of measuring constriction resistances is described. B.G.

N85-15979 Department of the Navy, Washington, D. C.
TRANSMISSION LINE BIASED COHERENT ARRAY OF JOSEPHSON OSCILLATORS Patent
J. E. Lukens, A. K. Jain, and P. M. Mankiewich, inventors (to Navy) Issued 28 Aug. 1984 6 p Supersedes AD-D008899 (AD-D011323; US-Patent-4,468,635; US-Patent-Appl-SN-258704; US-Patent-Class-331-107) Avail: US Patent and Trademark Office CSCL 20/12

A coherent array of Josephson oscillators is provided. Individual hysteresis-free Josephson junctions are longitudinally arranged in a gap of a central conductor in a line and have such a spacing as to substantially eliminate quasiparticle interactions. To provide a common frequency of operation, equal and opposite dc voltages are produced in adjacent pairs of the Josephson junctions by an arrangement of interlocking dc SQUID's (Super-conductive Quantum Interference Device) connected to the longitudinal central conductor using microwave bias tees. Phase coherence for the array is provided by a RF current circulating in an inductive feedback path that loops between the ends of the array. Author (GRA)

N85-15980 Department of the Navy, Washington, D. C.
DUAL BAND, LOW SIDELOBE, HIGH EFFICIENCY MIRROR ANTENNA Patent
D. D. Howard, inventor (to Navy) Issued 11 Sep. 1984 4 p Supersedes AD-D009751 (AD-D011329; US-Patent-4,471,359; US-Patent-Appl-SN-388563; US-Patent-Class-343-754) Avail: US Patent and Trademark Office CSCL 09/5

A dual band mirror antenna employing a continuous mirror without a hole is described. Side-by-side feeds for each band and an electromagnetic lens, located behind a rotatable twist reflector (the mirror), collimate beams toward a pair of polarized reflectors located near the twist reflector and tilted to aim the reflected energy toward the twist reflector. One polarized reflector is reflective at the higher radiofrequency band and transparent at the lower and radiofrequency band. The other polarized reflector is reflective at both bands. Energy directed back toward the polarized reflectors from the twist reflector passes through the polarized reflectors to free space. Author (GRA)

N85-15981 Department of the Navy, Washington, D. C.
COMPACT WIDEBAND MULTIPLE CONDUCTOR MONOPOLE ANTENNA Patent
R. K. Royce, inventor (to Navy) Issued 14 Aug. 1984 5 p Supersedes AD-D009259 (AD-D011331; US-Patent-4,466,003; US-Patent-Appl-SN-347219; US-Patent-Class-343-826) Avail: US Patent and Trademark Office CSCL 09/5

A wideband trap-loaded monopole antenna having small structural dimensions in a plane normal to the polarization axis. The traps are resistively-terminated quarter wavelength transmis-

sion lines. The locations and anti-resonant frequencies of the traps are selected to make the antenna's input impedance and gain nominally uniform parameters with respect to frequency.
Author (GRA)

N85-15982 Department of the Navy, Washington, D. C.
DUAL-GATE MESFET VARIABLE GAIN CONSTANT OUTPUT POWER AMPLIFIER Patent
M. Kumar, inventor (to Navy) Issued 26 Jun. 1984 6 p Supersedes AD-D008599
(AD-D011334; US-Patent-4,456,889; US-Patent-Appl-SN-270747; US-Patent-Class-330-279) Avail: US Patent and Trademark Office CSCL 09/5

A variable-gain, constant output power amplifier which generates an output RF signal of constant power level in response to an input RF signal of varying power level. The amplifier gain is preadjusted by a plurality of feed-forward automatic-gain-control circuits to provide the constant output power. The amplifier comprises five dual-gate MESFET signal-amplifying stages. The first and last stages do not have built-in automatic-gain-control. The first stage is provided for preamplification prior to sampling the input signal, and the last stage is provided for setting the level of the output power externally. The signal at the input of each of the middle three stages is sampled through a coupler and detected and processed at video frequencies to dynamically preadjust the gain of the next signal-amplifying stage.
Author (GRA)

N85-15983 Department of the Navy, Washington, D. C.
ANALOG TO DIGITAL CONVERTER Patent
B. L. Lewis, inventor (to Navy) Issued 11 Sep. 1984 9 p Supersedes AD-D008632
(AD-D011338; US-Patent-4-471,340; US-Patent-Appl-SN-269455; US-Patent-Class-340-347) Avail: US Patent and Trademark Office CSCL 09/5

A device for converting a signal voltage into a multi-bit digital word that defines the voltage magnitude and polarity is described. The input voltage V to be digitized is used to control the frequency of a voltage controlled oscillator, whose output is defined to be f=fo+kV. The signal out of the voltage controlled oscillator is fed to differential delay line filters that permit all digits to be derived in parallel. The filters comprise pairs of delay lines of unequal length, each pair feeding a respective phase detector whose output is amplified, diode-rectified and limited. To increase the accuracy of this device, an automatic frequency control loop can be incorporated to control fo. This loop zeros V occassionally and reads the output digital word to measure the frequency error and add a correcting voltage to the input voltage V when it is not zeroed for the measurement. Author (GRA)

N85-15984 Department of the Air Force, Washington, D.C.
DUAL MODE DIRECTIONALLY COUPLED BAND REJECT FILTER APPARATUS Patent
H. L. Thal, Jr., inventor (to Air Force) Issued 16 Oct. 1984 6 p Supersedes AD-D010099
(AD-D011359; US-Patent-4,477,787; US-Patent-Appl-SN-459159; US-Patent-Class-333-208) Avail: US Patent and Trademark Office CSCL 09/1

A dual mode directionally coupled band reject filter apparatus having coaxially aligned first and second cylindrical cavity members which are asymmetrically mounted to the broadwall of a waveguide is discussed. Both cylindrical cavity members include a plurality of tuning screws to establish elliptic-type responses. Author (GRA)

N85-15985 Department of the Air Force, Washington, D.C.
PROGRAMMABLE SYNCHRONOUS DIGITAL DELAY LINE Patent
T. J. Rehbein and W. Bonser, inventors (to Air Force) Issued 28 Aug. 1984 17 p Supersedes AD-D007602
(AD-D011382; US-Patent-4,468,624; US-Patent-Appl-SN-171913; US-Patent-Class-328-55) Avail: US Patent and Trademark Office CSCL 09/5

A synchronous digital delay line that can be programmed by variable delay increments to independently delay the leading and trailing edges of a digital signal and that can be utilized to provide a wide range of digital delaying requirements. Bipolar input data is processed to develop a mark data pulse stream representing the leading edges of input data pulses and a space data pulse stream representing the trailing edges of input data pulses. Each data pulse stream is delayed separately by a programmable random access memory delay circuit and the delayed outputs are recombined by a line driver latch to provide output data pulses that are delayed, delayed and compressed, or delayed and stretched in accordance with the programmed delays and system requirements. The programmable random access memory delay circuits each comprise a random access memory used as a variable length register having an address counter operating as a ring counter. Delay is varied by altering the maximum address at which the address counter is reset and is the product of the address clock rate and the 3 number of bits of memory used. The length of delay, delay increments, and stability, therefore, are a function of the clock source, clock rate, and memory size. Author (GRA)

N85-15986 Department of the Air Force, Washington, D.C.
SLOW WAVE CIRCUIT WITH SHAPED DIELECTRIC SUBSTRATE Patent
R. R. Moats, inventor (to Air Force) Issued 14 Aug. 1984 11 p Supersedes AD-D010050
(AD-D011385; US-Patent-4,465,988; US-Patent-Appl-SN-441816; US-Patent-Class-333-156) Avail: US Patent and Trademark Office CSCL 09/5

The substrate is ladder shaped and is located between a serpentine metallic meander line conductor and a metallic ground plane. Conductive shields are disposed in slot-like openings of the substrate between adjacent parallel transverse segments of the meander line to decrease dispersion and increase the bandwidth to a full octave. Author (GRA)

N85-15987 Defence Research Information Centre, Orpington (England).
THE DESIGN OF HIGH ORDER ACTIVE RC-FILTERS
V. I. Kapustyan Jul. 1984 279 p refs Transl. into ENGLISH of Radio i Sviaz (Moscow), 1982 Original language document was announced in IAA as A83-23827
(DRIC-T-7147; BR92739) Copyright. Avail: Issuing Activity

Information about active RC-filters is given, including cascade realization of active filters; multiloop realization of active filters; operational modeling of the LC-prototype; and typical links of the second order. Designs of typical sections of these filters are presented, as are methods of performing the design calculations. The principal design stages are illustrated with filters built using Soviet microcircuits. Author (ESA)

N85-15988*# National Aeronautics and Space Administration, Washington, D. C.
GAS PRESSURE AND ELECTRON DENSITY IN THE ACTIVE ZONE LEVEL OF HOLLOW CATHODE ARC DISCHARGES
H. Minoo Apr. 1984 17 p refs Transl. into ENGLISH of "La Pression du Gaz et la Densite des Electrons au Niveau de la Zone Active des Decharges d'Arc a Cathode Creuse" rept. NP-18708, LP-119 Paris Univ., Orsay, France, Nov. 1970 p 1-15 Original language document was announced as N71-30240
(Contract NASw-3541)
(NASA-TM-77468; NAS 1.15:77468; NP-18708; LP-119) Avail: NTIS HC A02/MF A01 CSCL 09C

The pressure (P) variations at the active zone level as a function of different discharge parameters were studied. A simplified model is proposed for the longitudinal variations of the partial pressures of electrons P(e), ions P(i), and neutrals P(o) inside the cathode tube. According to this model, P(e) and P(o) undergo important variations at the A.Z. level. Simplified calculations show that at this zone P is approx. P(e) and 0.5 < n sub e < 3.5 x 10 to the 15th power cm(3), where n sub e is the electron density. E.A.K.

N85-15989*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

POWER TRANSFER FROM NATURAL EMITTERS TO COLLECTION APERTURES AT MICROWAVE WAVELENGTHS
J. M. Stacey 1 Dec. 1984 32 p
(Contract NAS7-918)
(NASA-CR-174275; JPL-Publ-84-48; NAS 1.26:174275) Avail: NTIS HC A03/MF A01 CSCL 09C

The power transfer criteria necessary and sufficient to produce a detection of the emitting object by the collecting aperture and its receiver are shown. Range equations show the transfer of microwave energy from a passive, diffuse, emitting object that is located on a planetary surface, to a collecting aperture that is carried on an aerial platform or spacecraft. The mathematical relationships show in closed form the expressions for signal to noise ratio as a function of certain key parameters. The practical case of an emitting object on the Earth and a collecting aperture in orbit is presented. E.A.K.

N85-15990*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SPACEBORNE RECEIVERS: BASIC PRINCIPLES
J. M. Stacey 1 Dec. 1984 81 p refs
(Contract NAS7-918)
(NASA-CR-174269; JPL-Publ-84-49; NAS 1.26:174269) Avail: NTIS HC A05/MF A01 CSCL 09A

The underlying principles of operation of microwave receivers for space observations of planetary surfaces were examined. The design philosophy of the receiver as it is applied to operate functionally as an efficient receiving system, the principle of operation of the key components of the receiver, and the important differences among receiver types are explained. The operating performance and the sensitivity expectations for both the modulated and total power receiver configurations are outlined. The expressions are derived from first principles and are developed through the important intermediate stages to form practicle and easily applied equations. The transfer of thermodynamic energy from point to point within the receiver is illustrated. The language of microwave receivers is applied statistics. E.A.K.

N85-15991*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
TARGET DETECTION USING MICROWAVE IRRADIANCES FROM NATURAL SOURCES: A PASSIVE, LOCAL AND GLOBAL SURVEILLANCE SYSTEM
J. M. Stacey 15 Nov. 1984 38 p
(Contract NAS7-918)
(NASA-CR-174260; JPL-Publ-84-70; NAS 1.26:174260) Avail: NTIS HC A03/MF A01 CSCL 09C

Detection of metal objects on or near the Earth's surface was investigated using existing, passive, microwave sensors operating from Earth orbit. The range equations are derived from basic microwave principles and theories and the expressions are given explicitly to estimate the signal to noise ratio for detecting metal targets operating as bistatic scatterers. Actual measurements are made on a range of metal objects observed from orbit using existing passive microwave receiving systems. The details of the measurements and the results are tabulated and discussed. The advantages of a passive microwave sensor as it is applied to surveillance of metal objects as viewed from aerial platforms or from orbit, are examined. Author

N85-15992*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
PERFORMANCE CHARACTERISTICS OF A BATTERY CHARGER AND STATE-OF-CHARGE INDICATOR
D. Edwards and J. Klein 30 Sep. 1984 56 p refs
(JPL Proj. 5030-471; Contract DE-AI01-78CS-54209)
(NASA-CR-174273; JPL-Publ-84-92; NAS 1.26:174273; DOE/CS-54209/24) Avail: NTIS HC A04/MF A01 CSCL 10C

A battery charge/state of charge indicator (BC/SCI) system for electric vehicle use was developed. The original and subsequent objectives for the BC/SCI and the rationale for those objectives are described. The requirements generated from the objectives are listed and a description of the BC/SCI is provided. The power section problem, the tests, and the test results are discussed. E.A.K.

N85-15993*# Boeing Commercial Airplane Co., Seattle, Wash.
COST AND BENEFITS OPTIMIZATION MODEL FOR FAULT-TOLERANT AIRCRAFT ELECTRONIC SYSTEMS Final Report
Jan. 1983 298 p refs
(Contract NAS1-16669)
(NASA-CR-166043; NAS 1.26:166043) Avail: NTIS HC A13/MF A01 CSCL 09C

The factors involved in economic assessment of fault tolerant systems (FTS) and fault tolerant flight control systems (FTFCS) are discussed. Algorithms for optimization and economic analysis of FTFCS are documented. R.S.F.

N85-15994*# General Research Corp., McLean, Va.
DATA APPENDIX: F-NUMBER=1.0 EMR WITH A FLEXIBLE BACK ELECTRODE
D. J. Mihora Aug. 1984 72 p
(Contract NAS1-16133)
(NASA-CR-172477; NAS 1.26:172477; CR-4-998) Avail: NTIS HC A04/MF A01 CSCL 09A

A 12.5 micron Tedlar low f-number electrostatic membrane reflector was tested. The antenna reflector was designed to achieve a spherical reflector surface with a focal length to diameter ratio f(sub n) of one and a potential accuracy of 1.0 over its 4.88 m diameter. The configuration required the cutting and joining of twelve pie-shaped panels to form the reflector surface. Electrostatic forces are used to tension this preformed membrane reflector. The test data is spare-only three sets of measurements were taken due to lack of funds. B.G.

N85-15995# Wisconsin Univ., Madison. Dept. of Chemistry.
PHOTOLUMINESCENT AND ELECTROLUMINESCENT PROPERTIES OF Cd SUB 0.95 Mn SUB 0.05 Se ELECTRODES
A. A. Burk, Jr., A. B. Ellis, D. Ridgley, and A. Wold 28 Sep. 1984 5 p Submitted for publication Prepared in cooperation with Brown Univ.
(Contracts N00014-78-C-0633; N00014-77-C-0387; NR Proj. 051-690; NR Proj. 359-653)
(AD-A146775; UWIS/DC/TR-84/2; Rept-31) Avail: NTIS HC A02/MF A01 CSCL 09/1

Photoluminescence (PL) and electroluminescence (EL) can be used to characterize electric fields in semiconductor electrodes through their influence on electron-hole pair recombination. Solid solutions of II-VI compounds such as n-CdS and n-CdSe have provided a useful family of tunable band gap materials for such studies. We have extended these studies to emissive electrodes derived from a solid solution of MnSe and CdSe. In this paper we report that PL from N-Cd0.95Mn0.05Se electrodes used in photolectrochemical cells (PEC's) can be used to map the electric field in these solids, and that EL obtained from the electrodes originates, on average, nearer the semiconductor-electrolyte interface than PL. GRA

N85-15996# City Coll. of the City Univ. of New York. Dept. of Physics.
OPTICS OF SOLIDS (SURFACE RELATED) AND EFFECT OF SURFACE ROUGHNESS ON MOS Final Report
J. L. Birman 20 Sep. 1984 7 p
(Contract DAAG29-83-K-0019; Grant DAAG29-79-G-0040)
(AD-A146883; ARO-16180.14-PH; ARO-19601.1-PH) Avail: NTIS HC A02/MF A01 CSCL 09/1

Major results of these contracts included: (1) New predictions of giant enhanced Goos-Hanchen shift at resonance in semiconductors; (2) New predictions of spectral and temporal behavior of optical responses; and (3) New 4-wave mixing in resonant exciton semiconductors. Author (GRA)

N85-15997# Air Force Test and Evaluation Center, Kirtland AFB, N. Mex.
A TOTAL DOSE CHARACTERIZATION OF FIVE COMMERCIAL ANALOG MULTIPLEXERS Final Report, Nov. 1981 - Nov.

1983
Mark R. Ackermann Jul. 1984 42 p
(AF Proj. 8809)
(AD-A146886; AFWL-TR-84-07) Avail: NTIS HC A03/MF A01 CSCL 09/1

This report contains total dose radiation test data of five commercial grade analog multiplexers. Electrical parameter response data is provided and probable causes of failure are discussed. GRA

N85-15998# Texas Univ., Austin. Electronics Research Center.
ELECTRONICS RESEARCH AT THE UNIVERSITY OF TEXAS AT AUSTIN Annual Report, 1 Apr. 1983 - 31 Mar. 1984
E. J. Powers 15 May 1984 103 p
(Contract F49620-82-C-0033)
(AD-A146900; AR-31) Avail: NTIS HC A06/MF A01 CSCL 09/5

This report summarizes progress on projects carried out at the Electronics Research Center at The University of Texas at Austin and which were supported by the Joint Services Electronics Program. In the area of Information Electronics progress is reported for projects involving: (1) nonlinear estimation and detection, (2) electronic time-variant signal processing, and (3) digital time series analysis with applications to nonlinear wave phenomena. In the Solid State Electronics area recent findings in: (1) solid state interface reactions and instabilities, (2) electronic properties and structure of metal silicides and interfaces, and (3) implantation and interface properties of InP and related compounds are described. In the Quantum Electronics area progress is presented for the following projects: (1) quantum effects in laser induced damage, (2) nonlinear Raman scattering from molecular ions and (3) nonlinear optical interactions. In the Electromagnetics area progress in guided waves in composite structures is summarized. Author (GRA)

N85-15999# Howard Univ., Washington, D. C. Solid State Lab.
DEVELOPMENT OF SHORT GATE FET'S Final Report, Jun. 1981 - Jul. 1984
M. G. Spencer, G. L. Harris, and R. Haynes Jul. 1984 118 p
(Grant AF-AFOSR-0223-81)
(AD-A147033; AFOSR-84-0833TR) Avail: NTIS HC A06/MF A01 CSCL 09/1

The goal of this work was to investigate the performance limit of the standard GaAs FET structure. During the contract period we have constructed an AsCl3 epitaxial system used to provide buffer layers for our FET structures, we have developed a submicron lithographic process using deep U.V. techniques and, using these techniques we have produced working .5 micron gate devices. In addition, we have investigated the gettering of substrates as a technique to improve the mobility of ion implanted layers. The result of this experiment showed a correlation between Hall mobilities and gettered substrates. Finally, a investigation of a self aligned source drain structure has commenced and several theoretical studies are reported. Author (GRA)

N85-16000# Westinghouse Research and Development Center, Pittsburgh, Pa.
SUPERCONDUCTING ROTOR DYNAMICS Final Report, Sep. 1979 - Sep. 1983
R. D. Blaugher Wright-Patterson AFB, Ohio AFWAL 30 Sep. 1983 154 p
(Contract F33615-79-C-2026)
(AD-A147176; AFWAL-TR-84-2032) Avail: NTIS HC A08/MF A01 CSCL 10/2

This report is a review of the work performed to develop an experimental test rotor (RTF) to evaluate acceleration effects on superconducting Nb3Sn coils. The RTF was specifically modeled after the General Electric 20 MVA Advanced Rotor Design with respect to the centrifugal loading, cryogenic design, mechanical support and construction for the superconducting coils. This report reviews most of the important design considerations and details the superconducting test coil design and fabrication. Author (GRA)

N85-16001# Department of the Navy, Washington, D. C.
QUASI-OPTICAL HARMONIC GYROTRON AND GYROKLYSTRON Patent Application
W. Manheimer and B. Levush, inventors (to Navy) Filed 12 Jul. 1984 33 p
(AD-D011308; US-Patent-Appl-SN-630049) Avail: NTIS HC A03/MF A01 CSCL 09/1

A method and apparatus for suppressing lower order cyclotron harmonics in order to permit resonance within a quasi-optical gyrotron/gyroklystron configuration of a desired higher order harmonic. In the gyrotron/gyroklystron configuration at least one open resonator defined by at least two mirrors is positioned downstream from an electron beam source for receiving therethrough the beam of electrons and for exchanging energy therewith. This method includes the steps of choosing a mirror radius size rho for the mirrors forming the at least one open resonator which is large enough relative to the spot size of a desired radiation cyclotron harmonic omega (m) so that the harmonic omega (n) oscillates within the at least one resonator, but small enough so that the spot size for the next lower cyclotron harmonic omega (m) is larger than the mirror so that the harmonic omega (m) does not oscillate due to diffraction losses. Author (GRA)

N85-16002# Department of the Navy, Washington, D. C.
ELECTRONIC MODULE INSERTION AND RETRACTION MECHANISM Patent Application
J. J. Chino, inventor (to Navy) Filed 20 Jun. 1984 13 p
(AD-D011309; US-Patent-Appl-SN-622370) Avail: NTIS HC A02/MF A01 CSCL 09/5

A mechanism for inserting and aligning electronic modules, especially in dense configurations, is provided with removable ring means whereby the module assemblies may be automatically retracted. The removable ring means is installed near the threaded end of each mounting shaft. When a shaft is unscrewed from the chassis the ring means bears against a shoulder formed in the end-portion of the module assembly heat sink frame, thereby providing a lifting force on the module assembly. The ring means is easily installed or removed through an opening in the side of the end-portion. Author (GRA)

N85-16003# Department of the Navy, Washington, D. C.
LASER GENERATION OF ULTRASONIC WAVEFORM RECONSTRUCTIONS Patent Application
W. R. Scott and C. S. Ih, inventors (to Navy) Filed 19 Jan. 1983 13 p
(AD-D011314; US-Patent-Appl-SN-459073) Avail: NTIS HC A02/MF A01 CSCL 09/5

A series of pulses are transmitted to a first laser and the same series of pulses through a time delay network to a second laser. Each laser provides pulses of light through separate diagonal mirrors and through respective transparent holograms. Each light beam is then brought into convergence by respective sides of a wedge shaped reflector and brought into spacially coincident focus by an imaging lens onto the surface of a sample under test. The two hologram transparencies are imaged spacially coincident but separated in time on the face of the sample. Thermal elastic waves produced by a laser heating at the sample surface transform into a desired acoustic beam pattern determined by the nature of the wavefronts which the hologram transparency represents. The position of the coincident image on the sample may be moved by varying the time between the two pulses. Author (GRA)

N85-16004# Wisconsin Univ., Madison. Mathematics Research Center.
AN ASYMPTOTIC ANALYSIS OF A TRANSIENT p-n JUNCTION MODEL Technical Summary Report
C. Ringhofer Aug. 1984 35 p
(Contract DAAG29-80-C-0041)
(AD-A147270; MRC-TSR-2725) Avail: NTIS HC A03/MF A01 CSCL 09/1

In this paper we carry out an asymptotic analysis of the system of differential equations describing the transient behavior of a p-n-junction device (i.e., a diode). We determine the different

time-scales present in the equations and investigate which of them actually occur in physical situations. We derive asymptotic expansions of the solution and perform some numerical experiments. GRA

N85-16005# Illinois Univ., Urbana. Electromagnetic Communication Lab.
INVESTIGATION OF PLANAR WAVEGUIDES AND COMPONENTS FOR MILLIMETER-WAVE INTEGRATED CIRCUITS
K. J. Webb and R. Mittra Oct. 1984 89 p
(Contract DAAG29-82-K-0084)
(AD-A147380; UIEC-84-3; UILU-ENG-84-2555; ARO-18054.11-EL)
Avail: NTIS HC A05/MF A01 CSCL 09/5

Several important elements in millimeter-wave integrated circuit systems are studies. Filter-type structures which are composed of a series of discontinuities are employed frequently in such systems. The study of the general discontinuity problem is thus very important. The uniform fin-line structure is analyzed by using a spectral domain formulation with a moment method solution. This results in data for phase constants, mode functions and characteristic impedances. Two fundamentally different approaches for solving the discontinuity problem are presented. The first involves formulating the problem using unknowns in the plane of metallization, and both a single discontinuity and an infinite array of discontinuities are studied. Solutions are obtained using a moment method in the spectral domain. The second approach uses unknowns in the transverse junction plane. Solutions using the conjugate gradient iteractive method and the generalized variational procedure are studied. Scattering parameter data for several examples is presented. GRA

N85-16006# California Inst. of Tech., Pasadena.
LOW-LOSS FLEXIBLE DIELECTRIC WAVEGUIDE FOR MILLIMETER-WAVE TRANSMISSION AND ITS APPLICATION TO DEVICES Final Report, 28 Feb. 1982 - 30 Sep. 1983
William B. Bridges and Marvin B. Klein Aug. 1984 42 p
(Contract N00014-79-C-0839)
(AD-A147848; SRO-005-3; Rept-84-1-ONR) Avail: NTIS HC A03/MF A01 CSCL 09/1

Flexible dielectric waveguides have been fabricated for use at 94 GHz and 10 GHz by filling Teflon tubing with high dielectric constant powders. Losses as low as 0.18 dB/cm were measured at 94 GHz with these flexible guides. The theoretical expressions for a round dielectric waveguide with a finite thickness cladding were reviewed, and numerical calculations based on this theory gave good agreement with guide wavelength values measured on the 10 GHz guides. Shorted waveguide measurements at 10 GHz were used to determine dielectric constant as a function of powder density for various low-loss powders: Trans-Tech D-8512 barium tetratitanate, Trans-Tech D-38 barium tetratitanate, Trans-Tech D-30 nickel aluminum titatanate, Trans-Tech MCT-40 magnesium calcium titanate, and Emerson and Cuming Ecco-Flo. Guide wavelengths were also measured for waveguides made by filling rectangular grooves (approximately 1mm x 1mm) in Teflon substrates with low-loss powders. These measured wavelengths were compared to those predicted by the approximate theory of Marcatili. Author (GRA)

N85-16007# Polytechnic Inst. of New York, Brooklyn. Microwave Research Inst.
BASIC RESEARCH IN ELECTRONIC (JSEP): JOINT SERVICES ELECTRONICS PROGRAM Annual Report, 1 Apr. 1983 - 31 Mar. 1984
A. A. Oliner 30 Sep. 1984 207 p
(Contract F49620-82-C-0084)
(AD-A147891; POLY-MRI-1432-83; AFOSR-84-0978TR) Avail: NTIS HC A10/MF A01 CSCL 09/5

This Annual Report presents a summary of the scientific progress and accomplishments on research projects funded by the Joint Services Electronics Program (JSEP) for the contract period from 1 April 1983 through 31 March 1984. It does not contain information regarding accomplishments on research projects funded in other ways. The Joint Services Electronics Program at the Polytechnic is the core of interdisciplinary research in electronics encompassing programs in the Departments of Electrical Engineering and Physics under the aegis of the Microwave Research Institute. The research encompassed by this program is grouped under three broad categories: Electromagnetics, Solid State Electronics and Information Electronics. The detailed projects (work units) comprising the complete program are listed in the Table of Contents. Author (GRA)

N85-16008# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A BIRD STRIKE HANDBOOK FOR BASE-LEVEL MANAGERS M.S. Thesis
R. P. Payson and J. D. Vance Sep. 1984 223 p
(AD-A147928; AFIT/GLM/LSM/84S-52) Avail: NTIS HC A10/MF A01 CSCL 05/1

To help develop more awareness about bird strikes and bird strike reduction techniques, this thesis compiled all relevant information through an extensive literature search, review of base-level documents, and personal interviews. The final product--A Bird Strike Handbook for Base-Level Managers--provides information on bird strike statistics, methods to reduce the strike hazards, and means to obtain additional assistance. The handbook is organized for use by six major base agencies: Maintenance, Civil Engineering, Operations, Air Field Management, Safety, and Air Traffic Control. An appendix follows at the end. GRA

N85-16009# Department of the Air Force, Washington, D.C.
ELECTROMECHANICAL SWITCH Patent Application
A. P. Antonuzzi, inventor (to Air Force) Filed 6 Sep. 1984 25 p
(AD-D011400; US-Patent-Appl-SN-647781) Avail: NTIS HC A02/MF A01 CSCL 09/1

A hardened electromechanical switch is disclosed. When appropriate electrical contacts and pick-offs are aligned, four switches close. The possible number of switch combinations selectable are 4095 based upon a base eight counting system. The switch has a counter section and a memory section. The counter section uses an odometer like device based upon octal. Each counter wheel of the counter section has an electrical pick-off that interacts with the memory section. In the memory section, a plurality of octal numbers, four, are entered into and locked thereon such that each counter set disk, four, therein has one octal number thereon. Electrical contacts are placed on the counter set disks of the memory section and these touch the pick-offs of the counter wheels which will simultaneously close on the four contacts of the counter set disk in only one of the 4095 combinations noted above. Author (GRA)

N85-16010# Department of the Air Force, Washington, D.C.
LOW NOISE MULTIPLE CRYSTAL-CONTROLLED OSCILLATOR Patent Application
M. M. Driscoll, inventor (to Air Force) Filed 29 Aug. 1984 20 p
(AD-D011401; US-Patent-Appl-SN-645468) Avail: NTIS HC A02/MF A01 CSCL 09/1

An oscillator circuit utilizing multiple (two) quartz crystal resonators as the frequency controlling elements in a novel circuit arrangement. The use of two crystal units increases the oscillator circuit signal transmission group delay by a factor of 2 to 3 and effects an estimated 6dB reduction in oscillator output signal phase noise sideband level at carrier offset frequencies less than the resonator half-bandwidths. The degree of resonator tracking required is made practical with the use of temperature controlled SC-cut resonators. In addition, the oscillator circuit is configured so that equal, correlated output signal currents can be extracted from each resonator through individual load circuits, thereby increasing available oscillator output signal amplitude by 2:1 and reducing the net effect of uncorrelated load circuit additive noise by 3dB. Author (GRA)

N85-16011# Siemens A.G., Munich (West Germany). Unternehmensbereich Bauelemente.
DEVELOPMENT OF A 30 GHz/1 kW BROADBAND TRAVELING WAVE TUBE WITH SUPPRESSION OF BAND EDGE OSCILLA-

TIONS Final Report, Dec. 1981
Horst Seunik, Franz Weinzierl, and Erich Glass Bonn Bundesministerium fuer Forschung und Technologie Oct. 1984 81 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-W-84-035; ISSN-0170-1339) Avail: NTIS HC A05/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 17

A traveling wave tube (TWT) was improved in order to suppress spurious oscillations at the upper band edge of the passband of the slow wave structure. The matching of the RF vacuum window was improved and the dispersion characteristic of the slow wave structure was made a little steeper, whereas the operating bandwidth remained the same. The selective loss of H111-resonators to suppress the oscillation is optimized. Two model tubes were mounted. From 28 to 30 GHz, in a relative bandwith of 7%, a minimum output of 1 kW is obtained; at the center frequency it is between 1.6 and 1.4 kW. The gain is between 50 and 52 dB (the aim of the development). A second TWT was mounted in a special technology allowing a higher life expectancy of about 30,000 hr. Author (ESA)

N85-16012# EUROSIL G.m.b.H., Eching (West Germany).
DEVELOPMENT OF A 2 MICROMETER SILICON-GATE-CMOS-TECHNOLOGY FOR MICROCOMPUTER ORIENTED VLSI CIRCUITS WITH A SUPPLY VOLTAGE RANGE BETWEEN 1.5 AND 5 V Final Report, Sep. 1983
Gerhard Fischer, Tamas Kiss, Klaus Kummerow, Manfred Link, and Ute Scharzmann Bonn Bundesministerium fuer Forschung und Technologie Oct. 1984 246 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-84-203; ISSN-0340-7608) Avail: NTIS HC A11/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 41

The processes necessary for a 2 micron CMOS-technology were developed, including projection lithography, the oxidation process, the fabrication of thin oxides, and dry etching techniques for patterning silicon nitride, polysilicon, silicon oxide, and aluminum. With the aid of process simulations and experimental results, a process flow chart was established. A test chip with a large number of single structures and circuit blocks was designed in 2 micron tubes. Different runs of this test chip are produced. The success of the developed technology is demonstrated on different logic circuit blocks. Author (ESA)

N85-16013# Battelle Columbus Labs., Ohio.
CONTROL TECHNOLOGY FOR INTEGRATED CIRCUIT FABRICATION AT MICRO-CIRCUIT ENGINEERING, INCORPORATED, WEST PALM BEACH, FLORIDA
Gary I. Mihlan, Ralph I. Mitchell, and Russell K. Smith 3 Jul. 1984 25 p refs Sponsored by Industrial Environmental Research Lab. and National Inst. for Occupational Safety and Health
(PB85-100717/GAR; ECTB-115-22A) Avail: NTIS HC A02/MF A01 CSCL 06J

A survey to assess control technology for integrated circuit fabrication was conducted. Engineering controls included local and general exhaust ventilation, shielding, and personal protective equipment. Devices or work stations that contained toxic materials that were potentially dangerous were controlled by local exhaust ventilation. Less hazardous areas were controlled by general exhaust ventilation. Process isolation was used in the plasma etching, low pressure chemical vapor deposition, and metallization operations. Shielding was used in ion implantation units to control X-ray emissions, in contact mask alignes to limit ultraviolet (UV) emissions, and in plasma etching units to control radio-frequency and UV emissions. Most operations were automated. Use of personal protective equipment varied by job function. GRA

N85-16014# Joint Publications Research Service, Arlington, Va.
USSR REPORT: ELECTRONICS AND ELECTRICAL ENGINEERING Abstracts Only
20 Dec. 1984 49 p Transl. into ENGLISH from various Russian articles
(JPRS-UEE-84-018) Avail: NTIS HC A03

Abstracts of articles addressing a wide range of topics in electronics and electrical engineering are presented. Subject areas include radar, antennas and propagation, telecommunications, circuits and systems, electro-optics, acousto-optics, microwave techniques, and power engineering. For individual titles, see N85-16015 through N85-16024.

N85-16015# Joint Publications Research Service, Arlington, Va.
INTRINSIC POLARIZATION BASIS OF RADAR TARGET OBSERVED BY SYSTEM EMPLOYING DIVERSITY RECEPTION Abstract Only c32
Ye. L. Kazakov and Yu. M. Shishkin *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 2 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 77-81 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

The characteristics of the intrinsic polarization basis of a target observed by a system employing diversity reception, with the elements of the scattering polarization matrix measured at a remote receiving location, are examined. Methods are proposed for finding the elements of the matrix in that basis and its parameters. The concept of intrinsic polarization basis of a radar target during diversity reception is introduced: this is a basis in which the scattering polarization matrix of a target measured at a remote receiving location is diagonal. Methods for obtaining the elements of the target matrix in the intrinsic basis and its parameters are investigated in detail for the case of linear orthogonal bases. It is found that the intrinsic polarization basis of the target is generally elliptical and nonorthogonal for diversity reception. The methods employed make it possible to obtain the parameters of the intrinsic polarization basis and the elements of the scattering matrix in that basis for the case of diversity reception. Author

N85-16016# Joint Publications Research Service, Arlington, Va.
NEW CONSTRUCTION PRINCIPLES FOR OSCILLATOR POWER SUMMING DEVICES Abstract Only
S. Ye. London and S. V. Tomashevich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 10-11 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 17-23 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

Wideband single-stage multichannel devices for adding equal powers from an arbitrary number of oscillators are analyzed for the reflection coefficient in the working condition and for the decoupling between different inputs. The multiphase symmetrical excitation method is used to find these parameters. A device is described in which the oscillators are connected indirectly between the starting points of adjacent conductors in adjacent lines so that all of the power from the oscillators enters the common load when the amplitudes and phases are the same, but the inputs are shunted by the series inductances of the adjacent conductors of the adjacent lines. A schematic diagram of the device is presented. Author

N85-16017# Joint Publications Research Service, Arlington, Va.
ESTIMATION OF REQUIREMENTS FOR ACCEPTABLE NOISE RADIATION LEVEL OF COMMUNICATION TRANSMITTERS Abstract Only c32
I. A. Burkov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 13-14 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 34-36 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

An estimate of the acceptable and maximum requirements for the numerical values of standardized characteristics with allowance for the distinctive features underlying the standardization of the parameters of other equipment (receivers, for the case of transmitters) with which compatible operation must be ensured, as well as the basic electromagnetic situation indicators is analyzed. A formula is derived which can be used to find the acceptable transmitter noise radiation level as a function of the characteristics

of the receivers and the interference background. An example is presented for single sideband and frequency-modulated radiotelephone systems. It is found that the strength of the interference background has a significant influence on the noise strength starting at values 15 to 20 dB below the receiver sensitivity; the influence of the degree of receiver blocking by the primary radiation from the transmitter is felt below that limit. Author

N85-16018# Joint Publications Research Service, Arlington, Va.
FORMATION OF RADIO SIGNALS WITH LOW OUT-OF-BAND RADIATION Abstract Only **c32**
K. V. Filatov and Yud. O. Pokrovskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 14 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 8-11 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

A theoretical analysis is made of the effects of quantizing the lengths and shifts of partial radio pulses on the shape of the signal spectrum; recommendations are given for the optimum number of quantization levels needed to achieve the desired out-of-band radiation level in a given frequency band. Formulas are derived for the spectra and relative out-of-band energy for radio signals generated by pulse-width modulation of partial radio signals. Numerical examples are presented for a signal consisting of 64 partial signals with M=2(t) positions varying from 2 to 16,384 in each time interval. The signal envelope prototypes employed are Kaiser-Bessell, Hamming and Hann envelope. It is found that the bit length of the codes for the durations and shifts of the partial signals have a decisive influence on the out-of-band radiation level of the signal formed. The technical difficulty of implementing a signal generator employing digital pulse width modulation is determined only by the wavelength, and is independent of the way in which the envelope is approximated. Author

N85-16019# Joint Publications Research Service, Arlington, Va.
DIGITAL SIGNAL DEMODULATORS WITH SINGLE-SIDEBAND Abstract Only **c32**
E. A. Akchurin *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 19 Transl. into ENGLISH from Radiotekh. (Moscow), no. 6, Jun. 1984 p 3-9 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

Digital methods for processing signals constantly become more common in communications because of low cost, reliability and stability. A simple single-sideband demodulator for such use is described. Demodulation processes are analyzed in order to determine the most effective high-speed algorithms for its operation, without using multiplication operations in data processing. Theoretical presumptions and a series of three algorithms are summarized. The third selects discretization frequency, changes as needed for operation, obtains parallel values for successive operations with cosine or sine components for precise or linear-interpolated data, and obtains successive digital values by alternative selection from the previous successions. Use has shown this algorithm to be more precise as well as more rapid than those previously employed. Design of the actual digital device is diagramed and described. Author

N85-16020# Joint Publications Research Service, Arlington, Va.
PRECISION ELECTROOPTICAL DEFLECTOR BASED ON CORRUGATED LIGHT GUIDE Abstract Only
Yu. V. Vasleyb and V. B. Braude *In its* USSR Rept.: Electron and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 24 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 83-86 Original language document was announced in IAA as A84-46210 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

The main parameters of an electrooptical deflector with a corrugated lightguide are calculated. Owing to its planarity, small size, and high operating speed, the deflector shows promise as a controlled coupler in various integrated-optic devices B.J. (IAA)

N85-16021# Joint Publications Research Service, Arlington, Va.
MULTICHANNEL ELECTROOPTICAL MODULATORS FOR DIGITAL INFORMATION STORAGE AND PROCESSING SYSTEMS Abstract Only
L. B. Arkhontov, A. A. Danilov, B. S. Kiselev, M. M. Koblova, S. I. Kort, A. L. Mikaelyan, V. A. Shkitin, and V. I. Yanyuk *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 25 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 23-27 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

Multichannel electrooptical modulators based on Z-cut single crystals of lithium niobate with up to 10 channels were investigated. Formulas for modulator geometry based on the specific requirements for the parameters and technological manufacturing capabilities were derived. Two modulators, one with 16 and the other with 100 channels, and an optical system aperture of 35 mm are described. The characteristics of the devices are investigated in the beam of a helium-neon laser. It is found that they have low optical losses and high speed with relatively small control voltages. E.A.K.

N85-16022# Joint Publications Research Service, Arlington, Va.
MICRO-WAVEGUIDE TRANSFORMERS OF COHERENT OPTICAL SIGNALS Abstract Only
I. F. Budagyan, D. I. Mirovitskiy, and V. L. Nazarov *In its* USSR Rept.: Electron and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 29 Transl. into ENGLISH from Radiotekh. (Moscow), no. 6, Jun. 1984 p 9-14 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

Fourier transformers for optically compatible filtration devices, correlational and spectral analysis, and discrete phase transformers intended for operation in analog-digital transformers, correlator-interferometers and other precision detectors were developed. Contour and temperature factors involved in the functioning of such equipment are expressed in algorithms, which show that Fourier transformers have a filter shift critical point far below that for lens transformers for laterally heterogeneous waveguides. The device used for experimental confirmation of the mathematical hypothesis is diagrammed and described. Fiber optics discrete phase transformers for discretization and phase modulation of a given class of parameters are also diagramed. It is indicated that the precision of hologram reproduction for diffusion and discrete phase transformers and the sensitivity to changes in activation angle are identical. Signal to noise level was 10 decibels for diffusion transformers and 15 for the new device. Both constant and discrete processing of two dimensional signals was done more efficiently on the microwaveguide element base, and considerable space saving enhanced the simplicity of design for such installations. E.A.K.

N85-16023# Joint Publications Research Service, Arlington, Va.
TRANSFORMATION OF MODE COMPOSITION OF CIRCULAR OPTICAL WAVEGUIDE Abstract Only
D. I. Mirovskiy, L. A. Bondarev, I. F. Budagyan, V. V. Grigoryants, V. F. Dubrovin, and A. F. Smyk *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 36 Transl. into ENGLISH from Radiotekh. (Moscow), no. 7, Jul. 1984 p 27-33 Original language document was announced in IAA as A84-46205 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

The paper examines mode conversion in the case of the excitation of a single-mode waveguide by a multimode waveguide. The conversion efficiency is evaluated, and experimental results are presented which indicate that, during this conversion, it is possible to obtain power higher than these transferred by the principal mode of the exciting waveguide. In order to obtain the highest efficiency, the length of the multimode waveguide should be chosen with allowance for the distance between synphase sections. It is noted that the results obtained can be applied in holography and multimode laser technology. B.J. (IAA)

N85-16024# Joint Publications Research Service, Arlington, Va.
OPTIMIZATION PIEZOELECTRIC TRANSDUCER WIDTH OF ACOUSTO-OPTICAL DEVICES Abstract Only
B. S. Kiselev and V. K. Salakhutdinov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-018) 20 Dec. 1984 p 38 Transl. into ENGLISH from Radiotekh. (Moscow), no. 6, Jun. 1984 p 51-52 (For primary document see N85-16014 07-33)
Avail: NTIS HC A03

Recommendations for the selection of width of the acoustic transducer, in terms of the specific requirements for the distribution of acoustical energy in the interaction zone of the acousto-optical device (AOD) are presented. Wave analysis of the acoustical energy in the acoustic line is conducted to determine the sound wave length. The interaction between light and sound is traced to the Fresnel sound wave diffraction zone. The use of this approach without considering the nature of acoustic signal distribution and homogeneity requirements of the acoustic field in the interaction zone is considered likely to result in worse technical characteristics of the AOD. Diffraction effects must be considered in selecting the width of the transducer and positioning of the interaction zone of sound with light. E.A.K.

N85-16025# Joint Publications Research Service, Arlington, Va.
USSR REPORT: ELECTRONICS AND ELECTRICAL ENGINEERING
17 Dec. 1984 101 p Transl. into ENGLISH from various Russian articles
(JPRS-UEE-84-017) Avail: NTIS HC A06

Abstracts of several articles addressing various topics in electronics and electrical engineering are presented. Subject areas include signal processing, navigation and guidance systems, antennas and propagation, telecommunication, electron devices, instrumentation, control, microwave techniques, and others. For individual titles, see N85-16026 through N85-16055.

N85-16026# Joint Publications Research Service, Arlington, Va.
NONLINEAR PROCESSING OF OPTICAL PULSE SIGNALS Abstract Only c74
K. Ye. Rumyantsev *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 3 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 91-92 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The method of sequential statistical analysis is applied to space processing of optical pulse signals, for the purpose of shortening the scan time. The likelihood ratio is accordingly calculated upon arrival of each successive sample and then checked against its upper bound and lower bound. The expression for likelihood ratio depends on the approximation used for the distribution density of the photoreceiver output signal. Statistical simulation of the photodetection process revealed the closest approximating gamma distribution. Considering that the time constant of electron flight between dynode stages is inversely proportional to the photoreceiver bandwidth, with the constant coefficient in this relation varying from 0.048 to 0.036 for most commercial photomultipliers with 8 to 14 stages, the statistical characteristics of the photoreceiver output readings and the necessary sample size are calculated as functions of the statistical characteristics of the photoreceiver input signal and noise. The optimum photoreceiver bandwidth is then also determined on this basis, depending on the input signal-to-noise power ratio. M.G.

N85-16027# Joint Publications Research Service, Arlington, Va.
OPTIMIZATION OF ORIENTATION IN NAVIGATION BY TWO HEAVENLY BODIES Abstract Only c04
N. A. Azbukina and V. A. Vasilyev *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 5 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 8, Aug. 1984 p 54-59 Original language document previously announced in IAA as A85-10473 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Attention is given to the problem of the three-axis orientation of a spacecraft and the problem of refining the determination of coordinates and course on the basis of the observation of two reference stars. It is shown that of greatest geometrical and statistical effectiveness is the direct application of the least squares method to estimate the three-dimensional rotation vector according to four deviations from two stars. Results of a numerical study of the accuracy of the solution as a function of the angle between the stars are presented. B.J.(IAA)

N85-16028# Joint Publications Research Service, Arlington, Va.
ERRORS OF ANALOG OF INERTIAL COORDINATE SYSTEMS MODELED IN ASTRONAVIGATION SYSTEM Abstract Only c17
V. A. Karakashev, O. N. Anuchin, and T. V. Paderina *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 5 refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 8, Aug. 1984 p 60-65 Original language document previously announced in IAA as A85-10474 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The errors of the simulation of an inertial coordinate system (ICS) in an astronavigation-system computer are derived as a function of errors of direction finding and the recording of the equatorial coordinates of the observed celestial bodies. It is shown that the derived relationships can be used in the analysis and synthesis of astronavigation systems as well as complex navigation systems. B.J.(IAA)

N85-16029# Joint Publications Research Service, Arlington, Va.
USE OF SHANKS TRANSFORMATION FOR SPEEDING UP ADAPTATION PROCESS IN ANTENNA ARRAYS Abstract Only c32
I. V. Grubrin, O. I. Zaroshchinskiy, and V. I. Simoylenko *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 6 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 33-37 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Use of the Shanks transformation is considered for speeding up optimization of the weight vector during adaptation in antenna arrays by the method of steepest descent. The transient process for each weight factor is evaluated accordingly as the sum of m exponent terms, m being smaller than or equal to the number of adaptation channels and $2m+1$ readings of the mean weight vector sufficing for determination of its optimum value. Since it is not possible to estimate exactly the optimization error as a function of the deviations from the mathematical expectations of weight factors and as a function of the transient response parameters, this is done only approximately: with $m+1$ readings during the transient period and with a Shanks transformation based on three readings. A theoretical analysis reveals that the error can be large, determined principally by the smallest eigenvalue of the correlational interference matrix. Numerical simulation and a comparative analysis of the results reveal how much faster the algorithm of the Shanks transformation converges than other adaptation algorithms such as those of the instantaneous mean, the sliding mean, and independent averaging. Author

N85-16030# Joint Publications Research Service, Arlington, Va.
ANALYSIS OF THRESHOLD EFFECTS DURING ESTIMATION OF ARRIVAL TIME OF OPTICAL SIGNALS Abstract Only c32
A. P. Trifonov and Ye. P. Yenina *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 7 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 38-42 Original language document previously announced in IAA as A84-37106 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The characteristics of the maximum likelihood (ML) method and the Bayes estimation (BE) method are determined for a quadratic loss function with allowance for anomalous errors. The

expressions obtained for the characteristics of the ML and BE methods make it possible to choose between these methods depending on the accuracy requirements imposed on the estimation of the time of arrival of optical signals. B.J.(IAA)

N85-16031# Joint Publications Research Service, Arlington, Va.
ANALYSIS OF EFFECTIVENESS OF PARTIAL OPTIMIZATION OF SPATIAL PROCESSING SYSTEMS Abstract Only **c32**
Yu. I. Abramovich, L. A. Gurkina, and B. G. Danilov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 8 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1105-1109 Original language document previously announced in IAA as A84-41313 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Methods for the partial optimization of spatial signal processing systems are examined which make it possible to suppress the interfering signals and appropriate partial optimization scheme. V.L.(IAA)

N85-16032# Joint Publications Research Service, Arlington, Va.
POTENTIAL EFFECTIVENESS OF SPATIAL PROCESSING IN DETECTING SIGNALS AGAINST BACKGROUND OF INTERFERING REFLECTIONS Abstract Only **c32**
V. S. Chernyak *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 9 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1110-1119 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The potential for spatial compensation of interfering reflections and signal detection against the background of interference in the main and side lobes of the directivity pattern of arrays, and in systems employing separate antennas was assessed. The signal/(interference plus noise) ratio at the output of an optimum detector is investigated as a function of the angular extent of the family of interfering reflectors and the angular offset of the objects from the center of the family of interfering reflectors. The possibilities of spatial compensation for interference are examined. The results for a single transmitting antenna are extended to the case of several interfering antennas. The maximum achievable gain in signal to noise ratio is found for an object located near the center of the family of interfering reflectors for spatially coherent antenna systems and transmitting antennas. Analogous results can be obtained for spatially incoherent antenna systems and transmitting antennas. E.A.K.

N85-16033# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF ROW-AND-COLUMN CONTROL PRINCIPLE OF PHASE ANTENNA ARRAY FROM AMPLITUDE-PHASE DISTRIBUTION OF FIELD IN APERTURE Abstract Only **c32**
V. I. Kolodnikov and L. B. Tartakovskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 9 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1120-1124 Original language document previously announced in IAA as A84-41315 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

A simple algorithm for determining the line-column control law for phased arrays is proposed whereby the amplitude-phase field distribution in the aperture is used as starting information. The algorithm proposed here makes it possible to automatically compensate for certain design faults and specific design features of individual phase arrays. V.L.(IAA)

N85-16034# Joint Publications Research Service, Arlington, Va.
SLOW SURFACE MAGNETOPLASMA WAVES IN OBLIQUE MAGNETIC FIELD Abstract Only **c75**
V. I. Baybakov, V. N. Dapko, and Yu. V. Kistovich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 10 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1201-1203 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

New effects which arise when the external magnetic field is applied obliquely to the magnetized semiconductor in a system which employs slow surface magnetoplasma waves propagating along the surface of the semiconductor were demonstrated. It is shown that a surface wave propagating along the wave guide reacts only to the tangential component of the magnetic field and is magnetically sensitive to that component which is normal to the surface. It is suggested that this selectivity is associated with the formation and readjustment of the internal structural of the surface wave waveguide mode. This feature must be considered in order to understand the specifics of waveguides for surface magnetoplasma waves and magnetic field measuring devices based on them. E.A.K.

N85-16035# Joint Publications Research Service, Arlington, Va.
STRUCTURE OF FREQUENCY MODULATED AND PHASE-SHIFT KEYED SIGNALS REFLECTED FROM IONOSPHERE AT NEAR-CRITICAL FREQUENCIES Abstract Only **c32**
S. A. Namazov, Yu. I. Orlov, and N. N. Fedorov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 11 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1009-1016 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The structure of frequency modulated and phase shift keyed radio signals distorted as the result of dispersion effects and leakage of spectral components through the ionospheric layer was investigated in the region of the critical frequency. Linear frequency modulated (LFM) signals reflected from an ionospheric maximum region and approximated by a symmetrical Epstein layer are examined. The dispersion distortions of LFM sounding signals reflected from the maximum region of an isotropic ionospheric layer are analyzed. The dispersion distortions of LFM signals reflected from a magnetoactive ionospheric layer are examined in a longitudinal propagation approximation. The dynamics of the development of distortions as the ratio omega sub o omega sub cr varies are traced. The LFM signal compression by the ionosphere is investigated. Conditions under which a maximally compressed reflected signal with the greatest amplification can be obtained are examined. The use of beam representations on the basis of the space-time geometric theory or diffraction makes it possible to predict and interpret distortions of complex signals. E.A.K.

N85-16036# Joint Publications Research Service, Arlington, Va.
DISPERSION PROPERTIES OF MOVING IONOSPHERIC PERTURBATIONS Abstract Only **c32**
G. I. Grigoryev and N. G. Denisov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 11 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 1073-1075 Original language document previously announced in IAA as A85-11811 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The phase and group velocities of moving perturbations caused by distant distributed and point sources are analyzed. Horizontally moving perturbations in a thin layer are found to have the form of quasi-monochromatic waves with frequency and wave number related as k = omega(2)t/omega sub g z. This relationship can be viewed as a dispersion equation which, for a fixed t, defines the group velocity of horizontally moving perturbations: d omega/dk = r/zt. The basic parameters of moving perturbations (in a flat ionospheric layer) associated with acoustic gravity waves from a localized pulse mass source are estimated. Horizontally moving ionospheric perturbations are found to have the same structure as pressure wave perturbations in a neutral atmosphere and will consequently have the same dispersion properties as are established for acoustic waves. Author

N85-16037# Joint Publications Research Service, Arlington, Va.
INFLUENCE OF FARADAY EFFECT IN IONOSPHERE ON NONMUTUALITY OF METEOR RADIO CHANNEL Abstract Only **c32**

V. V. Sidorov, R. G. Khuzyashev, and A. N. Pleukhov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 12 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 1075-1077 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

An algorithm for analyzing a nonmutual meteor radio channel is examined for the case of normal incidence of the radio waves on the meteor trail. The meteor trail is modeled as an infinite plasma cylinder with Gaussian permitivity across the radius. The length of the meteor path is a function of the aximuth angle of the cylindrical coordinate system; the amplitude and phase of the scattered signals are nonmutual. The maximum values of the difference phase are found to be of the same order as the time derivative of the phase, indicating the accuracy of the model constructed. Author

N85-16038# Joint Publications Research Service, Arlington, Va.
REFLECTION THEOREMS FOR SOME ANISOTROPIC MEDIA Abstract Only **c75**
V. N. Krasilnikov and A. V. Tyukhtin *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 12 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 1018-1026 Original language document previously announced in IAA as A85-11806 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The present study examines the problem of a field described by an arbitrary differential equation (or set of equations) in a half-space and by the Direichlet or Neumann boundary condition on a plane. Specular-reflection theorems are obtained for a point source of electromagnetic waves in a moving dielectric, magneto-splasma, and crystal beyond the mirror is also considered.
L.M. (IAA)

N85-16039# Joint Publications Research Service, Arlington, Va.
TRANSFORMATION OF ELECTROMAGNETIC WAVES IN PLASMA WITH RANDOMLY-HETEROGENEOUS MAGNETIC FIELD Abstract Only **c75**
N. S. Bellyustin and M. A. Rayevskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 13 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 991-998 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The linear transformation of electromagnetic waves in a plasma with a randomly heterogeneous magnetic field is examined for arbitrary wave propagation direction with respect to the magnetic field. It is found that linear transformation of normal waves is significantly more effective than for the case in which the wave propagates along the external magnetic field. The influence of linear transformation on the Faraday rotation frequency of the ellipse of polarization is investigated. The statistics of the Stokes parameter are studied on the basis of the Einstein-Fokker-Planck equation. The behavior of the first and second moments of the Stokes parameters are studied in detail. Quantitative estimates are made for the solar chromospheric plasma. Analogous estimates indicate the importance of statistical transformation effects for propagation of electromagnetic waves in the Earth's magneto-sphere and in laboratory plasma. Author

N85-16040# Joint Publications Research Service, Arlington, Va.
FLUCTUATIONS DURING OBSERVATIONS OF EXTRATER-RESTRIAL SOURCES FROM OUTER SPACE THROUGH EARTH'S ATMOSPHERE Abstract Only **c93**
A. S. Gurvich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 14-15 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 951-959 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

A model to describe random heterogeneities in the index of refraction in the atmosphere is proposed which makes allowance for sphericity of the atmosphere. The correlation functions of the phase fluctuations behind the equivalent phase screen are calculated. The phase fluctuation spectra are expressed in general form through the spectra of the index of refraction. The influence of atmospheric sphericity and anisotropy of the heterogeneities on phase fluctuations of the transmitted radiation are examined using a Gaussian correlation function of the index of refraction as an example. Simple formulas are derived in the form of single integrals which connect specified spatial spectra of the relative fluctuations of the refraction with the spectra of the wave phase fluctuations. It is shown that calculation of the second moments of the phase for isomeric heterogeneities of the index of refraction yields the same results for the proposed atmospheric models as for the assumption that the relative fluctuations of the index of refraction are a statistically homogeneous random field. B.W.

N85-16041# Joint Publications Research Service, Arlington, Va.
TOLERANCE SYNTHESIS OF MULTILAYER RADOME WALLS Abstract Only **c32**
L. B. Lerman, P. P. Skurskiy, and T. V. Shumilo *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 26 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 82-84 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The design of plane multilayer radome walls for a receiver of electromagnetic waves within a given wavelength range lambda and a given incidence sector theta is considered from the standpoint of unitary construction and quantity production. Because analytical methods of tolerancing are not practical for multi-layer structures, a method of tolerance synthesis is proposed which uses the transmission coefficient for radio waves as the critical performance parameter. The method is applied to an N-layer wall and a linearly polarized wave of length incident at angle theta. The characteristic impedance matrix for such a wall with lossy layers is defined. B.W.

N85-16042# Joint Publications Research Service, Arlington, Va.
ARC EROSION OF METAL IN CURRENT INTERVAL OF 1-10 AMPERES Abstract Only **c26**
Nikolay Leonidovich Pravoverov and Aleksandr Ivanovich Struchkov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 34-35 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Elektromekhan. (Novocherkassk, USSR), no. 7, Jul. 1984 p 64-69 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Mathematical planning is reported of an experiment designed to show the dependency of arc erosion of Cu, Ni, Fe, Pd, Ag, and W on the current in a range of 1 to 10 amperes, with charge duration of 3 to 10 msec. Fixed contacts and input charge ranging from 1 to 10 amp were used in the tests. Erosion was measured by weighing the contacts after the tests. Erosion was dependent on cathode current for Ag and Pd. Results show that an oxide formed on the anode which broke down with rapid heating unless the melting point of the metal and the point of oxide disintegration were close together or coincided. At 5 amps, Al, Y, and Zr eroded chiefly at the anode. Aluminum, ittrium, and zirconium formed heat resistant oxides with high electrical resistance. R.S.F.

N85-16043# Joint Publications Research Service, Arlington, Va.
ART OF PROGRAMMING PROGRAMMABLE MICROCALCULA-TORS. PART 12: SOLUTION OF DIFFERENTIAL EQUATIONS Abstract Only **c61**
Ya. K. Trokhimenko and F. D. Lyubich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 36 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 56-62 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Programmable microcalculators can be programmed to solve first order ordinary differential equations for initial conditions x sub o, y sub o = y(x sub o) by various Runge-Kutta methods of numerical integration after conversion into corresponding difference equations. Nine programs which solve the equation y'=f(x,y) are

introduced. Methods employed in the programs include the Euler method, Euler-Cauchy method, Runge-Kutta method, and Adams method. Two programs available for solving ordinary differential equations of higher than first order: program 10/34 which solves a fourth order differential equation by the composite second order method and program 11/34 which solves the second order differential equation y'=f(x,y,y') by the fourth order Runge-Kutta method. R.S.F.

N85-16044# Joint Publications Research Service, Arlington, Va.
DIAGNOSIS OF INSULATION DEFECTS IN 1000+ V DISTRIBUTION NETWORKS WITH INSULATED NEUTRAL Abstract Only
V. M. Kutin and A. V. Kobylyanskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 37 Transl. into ENGLISH from Prom. Energ. (Moscow), no. 7, Jul. 1984 p 11-14 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Statistical data on insulation faults occurring over a period of one year in 6 to 10 kV distribution networks indicate that breakdown of insulators is the most frequent cause. The present simple method of continuous insulation checking by measurement of the neutral to ground bias voltage is not sufficiently reliable and accurate in the case of shorts through high contact resistances. A refinement of this method is proposed which makes it effective not only during such shorts through finite resistances but also during symmetric drops of insulation resistance. This alternative method involves source of rectified voltage with a precharged shunting capacitor to the network and monitoring the discharge transient which follows a short circuit to ground or a dip of the insulation resistance. The equipment includes a transformer and two diode rectifier bridges. The device is connected across the neutral under zero current conditions in the network. R.S.F.

N85-16045# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF MOMENTS OF INITIAL ESTIMATE DURING LINEAR APPROXIMATION OF DISTRIBUTION OF EJECTED IMPURITY Abstract Only c76
A. V. Amirkhanov, V. A. Kazinov, and V. R. Fayzrakhmanov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 40 Transl. into ENGLISH from Miroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 228-231 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Because the real distribution or profile of an impurity implanted in a semiconductor target is usually not a normal one, it becomes necessary to include higher order moments for a more accurate description of experimental data. The most accurate appear to be approximation of experimental data with an analytical curve f(x, u sub i) to the [j] power, ..., (u sub n) to the [j] power by the method of least squares (u sub i,...., u sub n moments of distribution, j=0.k - consecutive number of iteration). Three higher central moments of the distribution in the $x<0$ region were calculated as functions of the ratio of surface concentration to maximum concentration. A practical application of this procedure to typical phosphorus and boron implantations in silicon reveals that the linear initial approximation is acceptable for nearly normal distributions with higher than zero concentration at the surface and an attendant tail in the $x<0$ region. R.S.F.

N85-16046# Joint Publications Research Service, Arlington, Va.
DEPENDENCE OF BREAKDOWN VOLTAGE FOR p-n JUNCTION ON PARAMETERS OF ION IMPLANTATION AND SEMICONDUCTOR HEAT TREATMENT Abstract Only c76
N. V. Makarets, M. A. Rozanova, G. L. Falko, and A. M. Fedorchenko *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 42 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 264-268 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Avalanche breakdown of a p-n junction after ion implantation and subsequent impurity redistribution by diffusion during heat treatment of the semiconductor is analyzed. The post diffusion impurity concentration is calculated. The corresponding equation of the transient process is solved with the use of Green's function and for a temperature dependent diffusion coefficient. The breakdown voltage is a function of the energy gap and of the ratio of minimum radius of curvature of the junction surface to the width of the depletion layer at breakdown. Further calculations yield the dependence of the breakdown voltage on the implantation dose, on the diffusion distance, and on the impurity concentration in the substrate. Numerical data pertaining to a silicon structure doped with boron through windows of various sizes and shapes in the mask indicate that annealing should raise the avalanche breakdown voltage appreciably in the case of sufficiently long diffusion distances. Author

N85-16047# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF PARAMETERS OF DOPED THIN SEMICONDUCTOR LAYERS FROM PLASMATIC MINIMUM OF REFLECTION COEFFICIENT FOR INFRARED RADIATION Abstract Only c76
N. A. Denisova, T. A. Kruze, A. V. Rezvov, and D. I. Tetelbaum *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 42 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 269-275 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The concept of an equivalent homogeneous layer is introduced in order to determine the parameters of depthwise nonuniformly doped thin semiconductor layers by the reflection method of infrared spectroscopy. The effective layer thickness and the effective concentration of free charge carriers can be determined, independently of the effective charge carrier mobility, from the plasmatic minimum reflection coefficient and the charge carrier frequency at which it occurs. This is possible because both parameters of the plasmatic reflection dip depend uniquely on those two parameters of a doped semiconductor layer. The relations are established in approximate analytical form for frequencies above the plasma frequency of free charge carriers in free spaces. These relations in normalized form, taking into account the dielectric permittivity of the substrate material and including the dissipation parameter, were applied to silicon layers doped by ion implantation and by diffusion. Author

N85-16048# Joint Publications Research Service, Arlington, Va.
INVESTIGATION OF SEMIAUTOMATIC AIRCRAFT CONTROL PROCESSES EMPLOYING TIME REDUNDANCY IN ON-BOARD DIGITAL TRAJECTORY CONTROL COMPUTERS Abstract Only c08
S. M. Fedorov, N. N. Sukhikh, and M. Yu. Smurov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 49 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 8, Aug. 1984 p 20-24 Original language document previously announced in IAA as A85-10470 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Aircraft semiautomatic control processes are analyzed with allowance for the failure and recovery of the onboard computers using timer redundancy methods. The admissible time of computer recovery is estimated, and results of semifull scale simulation of the digital system are presented for different values of the discreteness period. B.J. (IAA)

N85-16049# Joint Publications Research Service, Arlington, Va.
DIGITAL THERMOMETER WITH LINEARIZER ON SLIDE WIRE Abstract Only c35
I. A. Belousov, A. A. Sachenko, and V. V. Kochan *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 54 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Prioborostr. (Leningrad), v. 27, no. 6, Jun. 1984 p 82-86 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Means of linearizing the measurement characteristics of primary instrument transducers were developed for temperature recorders, in which case an auxiliary transducer in the form of a

linearization slide wire is added to the thermoelectric transducer with a F(t)=kt + delta(t) characteristic (t-temperature, delta (t) << kt) and an arithmetic unit is added for calculating e=F(t)-delta(t). The 2 channel instrument built according to these principles covers the 700 to 1300 C temperature range with a 0.1 C resolution and a + or - 1 C error not counting the thermocouple instability. B.G.

N85-16050# Joint Publications Research Service, Arlington, Va.
ENSURING REQUIRED METROLOGICAL RELIABILITY OF ANALOG INSTRUMENT CHANNELS BY PARAMETRIC COMPENSATION Abstract Only **c35**
R. V. Dolidze and I. V. Mostovoy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 55 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 6, Jun. 1984 p 87-91 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The method of parametric compensation is proposed for ensuring the required reliability of analog instrument channels in aggregate measurement and information systems, considering that aggregation with analog channels is limited by the finite number of available standard functional components. The iterative algorithm of parametric compensation and synthesis through solution of that inequality with lower bound was programmed in FORTRAN-IV for a vector of continuous assembly parameters and with proximity of the aging model to the mathematical expectation of changes model as optimality criterion. First the vector of assembly parameters is varied and then, if necessary, the mathematical expectation of changes. The method was successfully applied to an automatic control and regulation system with an analog instrument channel containing 16 functional components, using a comparator consisting of one integrated circuit, 3 transistors, 7 diodes, 5 capacitors, and 20 resistors as compensator. B.G.

N85-16051# Joint Publications Research Service, Arlington, Va.
LINEAR WIDEBAND MICROWAVE AMPLIFIERS FOR MONOLITHIC INTEGRATED MICROCIRCUITS Abstract Only
A. I. Kushnirenko and G. V. Petrov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 62 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 78-80 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The main problem in designing monolithic integrated analog devices with GaAs field-effect transistors, especially microwave amplifiers with bandwidths ranging from tens of megahertz to several gigahertz, is the rational layout of passive matching circuits on the semiconductor chip. One way to decrease the required chip size for such an amplifier is to use field-effect transistors with a Schottky gate, the next step being to match appropriately common-gate and common-drain stages or common-drain and common-source stages. The matching circuit is based on the drain-to-source impedance of a transistor and the maximum attainable Q-factor of the effective inductance in the simplified equivalent circuit. The frequency characteristics of gain, bandwidth, and voltage standing-wave ratio were calculated for such amplifiers, one with an emitter follower between the common-gate stage and common-drain stage, one with an emitter follower between the common-drain stage and common-source stage, and one, for comparison, with resistors equivalent to no matching between stages. Author

N85-16052# Joint Publications Research Service, Arlington, Va.
REAL-TIME ANALYSIS OF SPACE CHARACTERISTICS OF MICROWAVE ELECTROMAGNETIC PULSE FIELDS BY MEANS OF CONTROLLABLE LAYER STRUCTURES Abstract Only **c32**
V. P. Dudkin and Yu. S. Obtemperanskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 63 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 43-47 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

A method is proposed for analyzing the space characteristics of microwave electromagnetic fields, not only of continuous but also of pulsating ones, which were recorded sequentially by scanning. The gist of this method is passive probing based on photoconduction in semiconductors and using a local inhomogeneity with higher concentration of excess charge carriers. An experimental prototype was built which used a pyramidal horn antenna for receiving the field signals reradiated by the probe and a planar dielectric-semiconductor-metal structure as scanner screen, with a circular aperture 100 mm in diameter and a resolution of at least 2 lines/mm. It was successfully used for analyzing the interference pattern of two coherent spherical waves, one coming from a standard microwave oscillator operating either continuously or in pulses. B.G

N85-16053# Joint Publications Research Service, Arlington, Va.
IMPROVEMENT OF ELECTROMECHANICAL SYSTEMS BY UTILIZATION OF MICROELECTRONIC TECHNOLOGY Abstract Only
Yu. A. Bortsov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 68 Transl. into ENGLISH from Elektrotekhn. (Moscow), no. 7, Jul. 1984 p 20-24 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The universal principles of constructing adaptive electromechanical servomechanisms are systematically formulated, with consideration given to possible causes of object instability and the characteristics of corresponding changes. The most common causes are changes in the servomechanism configuration, caused by geometrical distortion or inadvertent movement of parts, change in the apparent mass, transiency of visco-elastic couplings, change in object or control parameters under control action, and temperature changes or aging. Adaptive control with various types of analog or digital regulators is designed on the basis of equations describing the object, the appropriate reference model, and the regulator, respectively. The particular algorithm of control and the corresponding structure executing it depend on whether the object is rigid, elastic, or flexible, whether it is linear or nonlinear, and whether it is stationary or nonstationary. Inclusion of a microcomputer in the regulator loop constitutes a significant advancement in the art of servomechanism construction and application. Author

N85-16054# Joint Publications Research Service, Arlington, Va.
LOGIC ELEMENTS FOR SYSTEMS WITH VARIABLE STRUCTURE Abstract Only
L. L. Golik, M. I. Yelinson, P. I. Perov, and A. M. Sharov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 79-80 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 206-213 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

Logic devices for adaptive systems with variable structure are synthesized with the consideration that such systems require a distributed controllable memory and a distributed adjustment control for individual components. The basic logic device is considered to be a universal one capable of computing any Boolean function and equipped with a local memory array as well as with a local mechanism or adjustment of its parameters. In the design process it is necessary to estimate the quality of the state at any given instant, typically characterized by the system error at that time. This is done, considering that all known statistical criteria for sequences of binary quantities are functions of two parameters: frequency of single bits and length of sequence. Group criteria rather than individual criteria are applied to this case. B.G.

N85-16055# Joint Publications Research Service, Arlington, Va.
TRENDS IN DEVELOPMENT OF SOFTWARE FOR COMPUTER-AIDED ANALYSIS OF LARGE-SCALE INTEGRATED CIRCUITS Abstract Only **c61**
I. P. Norenkov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 80 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984

p 222-227 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

The fundamental mathematical model of integrated circuits is a system of ordinary differential equations. Computer-aided analysis of such circuits requires numerical integration of these equations. For small-scale integrated circuits in the initial stage of development during the 1960s this was done by explicit methods incorporated in the first-generation software. Step-up to medium-scale integration during the 1970's required more adequate algorithms and implicit methods replaced explicit ones in the second-generation software. As the trend continues into large-scale integration and toward very-large-scale integration, still more efficient algorithms are needed and are being proposed for the third-generation software. Hybrid logic-electric circuit simulation is one approach, namely splitting the LSI circuit into two parts repesentable by logic equations and ordinary differential equations, respectively. This approach should lead to multilevel restructurable mathematical models with various appropriate representation of circuit fragments. B.G.

N85-16347*# General Semiconductor Industries, Inc., Tempe, Ariz.
THE ac POWER LINE PROTECTION FOR AN IEEE 587 CLASS B ENVIRONMENT
William D. Roehr and O. Melville Clark *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 5 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 09A

34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

N85-16056 British Library Lending Div., Boston Spa (England).
INSTABILITY OF FILM BOILING OF MOVING LIQUIDS
V. M. Budov, I. A. Shemagin, and V. A. Sokolov 24 Sep. 1984 5 p ref Transl. into ENGLISH from Inz. Fiz. Zh. (USSR), v. 44, no. 3, 1983 p 425-428 Original language document was announced in IAA as A84-28556
(BLL-WH-603-(9091.9F)) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

The effect of the motion of a liquid on the development of a film boiling instability is analyzed using a nonlinear model. In particular, the boiling of a saturated liquid moving along a vertical surface is considered. The problem of determining the conditions for an interface instability is reduced to an analysis of a dispersion equation. It is shown that an increase in the liquid velocity leads to an increase in the phase velocity, while the interface wave length decreases. V.L. (IAA)

N85-16057 British Library Lending Div., Boston Spa (England).
ANALYSIS OF THE HEATING PROCESS OF A BODY IN A MELT
S. A. Krupennikov and Yu. P. Filimonov 3 Dec. 1984 9 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chernaya Met. (USSR), no. 5, 1984 p 120-124
(BLL-M-36014-(5828.4)) Avail: British Library Lending Div., Boston Spa, England

A mathematical model describing the heating of a body in a melt is derived on the assumption that the temperature variation in the solidified layer is quasi-stationary in character. It enables the duration of the period in which the solidified layer exists to be represented in the form of a function of dimensionless variables. Known analytical solutions of thermal conduction equations can be used in analyzing this function in certain limiting cases. Author

N85-16058 British Library Lending Div., Boston Spa (England).
ALLOWING FOR THE TEMPERATURE FIELD IN THE WALL THICKNESS OF CHECKERWORK IN THERMAL CALCULATION
E. A. Surgucheva, F. R. Shklyar, S. L. Solomentsev, and V. D. Korshikov 3 Dec. 1984 7 p refs Transl. ENGLISH from Izv. Vyssh. Ucheb. Zaved., Chernaya Met. (USSR), no. 5, 1984 p 127-129
(BLL-M-36015-(5828.4)) Avail: British Library Lending Div., Boston Spa, England

The temperature field through the wall thickness of the checkerwork in regenerator-type heat exchangers and its influence on calculations is considered for hexagonal blocks with six cylindrical passages, which are approximated by hollow cylinders. A solution is given for finding the temperature field with periodic heating and cooling and constancy of heat flows. Shape factors for use in regenerator calculations are given. Author

N85-16059*# Old Dominion Univ., Norfolk, Va. Dept. of Mechanical Engineering and Mechanics.
A SECOND-ORDER ACCURATE PARABOLIZED NAVIER-STOKES ALGORITHM FOR INTERNAL FLOWS Progress Report, period ending 31 Jul. 1984
Tawit Chitsomboon and S. N. Tiwari Nov. 1984 25 p refs
(Grant NAG1-423)
(NASA-CR-174258; NAS 1.26:174258) Avail: NTIS HC A02/MF A01 CSCL 20D

A parabolized implicit Navier-Stokes algorithm which is of second-order accuracy in both the cross flow and marching directions is presented. The algorithm is used to analyze three model supersonic flow problems (the flow over a 10-degree edge). The results are found to be in good agreement with the results of other techniques available in the literature. B.W.

N85-16060*# Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.
COMPUTATIONAL ANALYSIS OF SCRAMJET DUAL MODE OPERATION Progress Report, 1 May - 31 Oct. 1984
10 Jan. 1985 12 p refs
(Grant NAG1-229)
(NASA-CR-174250; NAS 1.26:174250) Avail: NTIS HC A02/MF A01 CSCL 20D

One critical element in the design of a Scramjet is the detailed understanding of the complex flow field in the engine during various phases of operation. One area of interest is the computation of chemically reacting flows in the vicinity of flame holders. The characteristics of a method for solving the Navier-Stokes equations with chemical reactions are proposed. Also of interest are the flame holding characteristics of simple ramp and rearward facing steps. Both of these configurations are considered candidates for Scramjet flame holders. B.G.

N85-16061# Toronto Univ. (Ontario). Inst. for Aerospace Studies.
NUMERICAL RECONSTRUCTION OF PART OF AN ACTUAL BLAST-WAVE FLOW FIELD TO AGREE WITH AVAILABLE EXPERIMENTAL DATA
S. C. M. Lau and J. J. Gottlieb Nov. 1983 185 p refs
(UTIAS-TN-251; ISSN-0082-5263) Avail: NTIS HC A09/MF A01

A method of solution is presented and validated for the numerical reconstruction of a certain part of an actual blast-wave flow field of interest for planar, cylindrical and spherical explosions, away from the explosion source where the blast-wave has become sufficiently weak that real-gas effects are unimportant. This method involves, essentially, a trial-and-error process of constructing the best possible path of a fluid particle or equivalent piston at the upstream side of the flow field of interest such that the resulting flow field constructed numerically in front of the equivalent moving piston agrees as well as possible with all available although limited experimental data. The relatively new random-choice method was suitably modified to easily handle the numerical computations of the nonstationary flow in front of the moving piston. Finally, the present method is used to reconstruct the flow field for past TNT

and ANFO explosions, for which the blast-wave amplitudes are less than about 1 MPa. These results are presented in convenient graphical and tabular form, scaled for the case of a 1-kg TNT surface explosion or its equivalent in a standard atmosphere, so that they can be utilized readily for different sized explosions at the same or other atmospheric conditions. Author

N85-16062*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NUMERICAL STUDIES OF INTERACTING VORTICES
Grace C. Liu and Chung-Hao Hsu (Kansas Univ., Lawrence) Jan. 1985 16 p refs
(NASA-TM-86325; NAS 1.15:86325) Avail: NTIS HC A02/MF A01 CSCL 20D

To get a basic understanding of the physics of flowfields modeled by vortex filaments with finite vortical cores, systematic numerical studies of the interactions of two dimensional vortices and pairs of coaxial axisymmetric circular vortex rings were made. Finite difference solutions of the unsteady incompressible Navier-Stokes equations were carried out using vorticity and stream function as primary variables. Special emphasis was placed on the formulation of appropriate boundary conditions necessary for the calculations in a finite computational domain. Numerical results illustrate the interaction of vortex filaments, demonstrate when and how they merge with each other, and establish the region of validity for an asymptotic analysis. Author

N85-16063*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ON THE INSTABILITY OF A 3-DIMENSIONAL ATTACHMENT LINE BOUNDARY LAYER: WEAKLY NONLINEAR THEORY AND A NUMERICAL APPROACH Final Report
Philip Hall and Mujeeb R. Malik Dec. 1984 67 p refs
(Contract NAS1-17070)
(NASA-CR-172504; ICASE-84-64; NAS 1.26:172504) Avail: NTIS HC A04/MF A01 CSCL 20D

The instability of a three dimensional attachment line boundary layer is considered in the nonlinear regime. Using weakly nonlinear theory, it is found that, apart from a small interval near the (linear) critical Reynolds number, finite amplitude solutions bifurcate subcritically from the upper branch of the neutral curve. The time dependent Navier-Stokes equations for the attachment line flow have been solved using a Fourier-Chebyshev spectral method and the subcritical instability is found at wavenumbers that correspond to the upper branch. Both the theory and the numerical calculations show the existence of supercritical finite amplitude (equilibrium) states near the lower branch which explains why the observed flow exhibits a preference for the lower branch modes. The effect of blowing and suction on nonlinear stability of the attachment line boundary layer is also investigated. Author

N85-16064*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EXISTENCE AND NON-UNIQUENESS OF SIMILARITY SOLUTIONS OF A BOUNDARY LAYER PROBLEM Final Report
M. Y. Hussaini and W. D. Lakin Dec. 1984 19 p refs
(Contract NAS1-17070)
(NASA-CR-172503; ICASE-84-60; NAS 1.26:172503) Avail: NTIS HC A02/MF A01 CSCL 20D

A Blasius boundary value problem with inhomogeneous lower boundary conditions $f(0) = 0$ and $f'(0) = -$ lambda with lambda strictly positive was considered. The Crocco variable formulation of this problem has a key term which changes sign in the interval of interest. It is shown that solutions of the boundary value problem do not exist for values of lambda larger than a positive critical value lambda. The existence of solutions is proven for $0 <$ lambda $<$ lambda by considering an equivalent initial value problem. It is found however that for $0 <$ lambda $<$ lambda, solutions of the boundary value problem are nonunique. Physically, this nonuniqueness is related to multiple values of the skin friction. E.A.K.

N85-16065*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LAMINAR HEAT-TRANSFER DISTRIBUTIONS ON BICONICS AT INCIDENCE IN HYPERSONIC-HYPERVELOCITY FLOWS
Charles G. Miller, III, John R. Micol, and Peter A. Gnoffo Jan. 1984 145 p refs
(NASA-TP-2213; L-15645; NAS 1.60:2213) Avail: NTIS HC A07/MF A01 CSCL 20D

Laminar heating distributions were measured at hypersonic-hypervelocity flow conditions on a 1.9-percent-scale model of an aeroassisted vehicle proposed for missions to a number of planets. This vehicle is a spherically blunted, 12.84/7deg biconic with the fore-cone axis bent upward 7 deg relative to the aft-cone axis to provide selftrim capability. Also tested was a straight biconic (i.e., without nose bend) with the same nose radius and half-angles as the bent-nose biconic. These measurements were made in the Langley Expansion Tube at free-stream velocities from 4.5 to 6.9 km/sec and Mach numbers from 6.0 to 9.0 with helium, nitrogen, air, and carbon dioxide test gases. The range of calculated thermochemical equilibrium normal-shock density ratios for these four test gases was 4 to 19. Angles of attack, referenced to the aft-cone, varied from 0 to 20 deg. Heating distributions predicted with a parabolized Navier-Stokes (PNS) code were compared with measurement for helium and air test gases. Measured windward and leeward heating levels were generally underpredicted by the PNS code for both test gases, and agreement was poorer on the leeward side than on the windward side. Author

N85-16066*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
REDUCTION METHOD FOR THERMAL ANALYSIS OF COMPLEX AEROSPACE STRUCTURES
Charles P. Shore Jan. 1985 31 p refs
(NASA-TP-2373; L-15777; NAS 1.60:2373) Avail: NTIS HC A03/MF A01 CSCL 20D

A reduction method which combines classical Rayleigh-Ritz modal superposition techniques with contemporary finite-element methods is applied to transient nonlinear thermal analysis of aerospace structures. The essence of the method is the use of a few thermal modes from eigenvalue analyses as basis vectors to represent the temperature response in the structure. The method is used to obtain approximate temperature histories for a portion of the Shuttle orbiter wing subject to reentry heating and for a large space antenna reflector subject to heating associated with a low Earth orbit. The reduction method has excellent potential for significant size reduction for radiation-dominated problems such as the antenna reflector. However, for conduction-dominated problems such as the Shuttle wing, especially those with complex spatial and temporal variations in the applied heating, additional work appears necessary to find alternate sources of basis vectors which will permit significant problem size reductions. Author

N85-16067# Spectron Development Labs., Inc., Costa Mesa, Calif.
AERO-OPTICS EXPERIMENTAL TECHNIQUES Final Technical Report
W. C. Rose Kirtland AFB, N. Mex. AFWL Jul. 1984 45 p Prepared in cooperation with Rose Engineering and Research Inc.
(Contract F29601-82-C-0013)
(AD-A146755; AFWL-TN-84-30) Avail: NTIS HC A03/MF A01 CSCL 20/4

This report summarizes results of a study to determine the most appropriate aerodynamic experimental techniques for gathering data in aircraft boundary layer and shear layer turbulent flow, flow fields. It focuses on two primary techniques: hot-wire anemometry and five-hole pressure probes, and develops reduction equations for obtaining the desired aerodynamic parameters from raw data. It also presents comparison of hot-wire data using splitfilm probes and x-film probes collected during an airborne experiment. GRA

N85-16068# Illinois Univ., Urbana. Dept. of Chemical Engineering.
STUDIES OF THE WALL SHEAR STRESS IN A TURBULENT PULSATING PIPE FLOW Progress Report, 1981 - 1984

Z. X. Mao and T. J. Hanratty Sep. 1984 177 p
(Contract N00014-82-K-0324)
(AD-A146772; PR-5) Avail: NTIS HC A09/MF A01 CSCL 20/4

Measurements are presented of the time variation of the wall shear stress caused by the imposition of a sinusoidal oscillation on a turbulent pipe flow. The amplitude of the oscillation is small enough that a linear response is obtained and the dimensionless frequency, omega +, is large compared to that studied by most previous investigators. The most striking feature of the results is a relaxation effect, similar to what has been observed for flow over a wavy surface, whereby the phase angle characterizing the temporal variation of the wall shear stress undergoes a sharp change over a rather narrow range of omega +. At omega + larger than the median frequency of the turbulence there appears to be an interaction between the imposed flow oscillation and the turbulence fluctuations in the viscous sublayer, which is not described by present theories of turbulence. GRA

N85-16069# McDonnell-Douglas Corp., Long Beach, Calif.
SOME IMPORTANT PROBLEMS IN UNSTEADY BOUNDARY LAYERS INCLUDING SEPARATION. 2: UNSTEADY BOUNDARY LAYERS CLOSE TO THE STAGNATION REGION OF SLENDER BODIES Annual Report, 15 Mar. 1983 - 14 Mar. 1984
T. Cebeci, K. Stewartson, and S. M. Schimke Jun. 1984 39 p
(Contract F49620-82-C-0055)
(AD-A146964; MDC-J3527; AFOSR-84-0861TR) Avail: NTIS HC A03/MF A01 CSCL 20/4

The evolution of unsteady boundary layers on the plane of symmetry of a slender prolate spheroid in uniform motion at constant angle of attack after an impulsive start has been studied for the case of prescribed pressure distribution. Calculated results have been obtained for angles of attack ranging from 30 degrees to 50 degrees and show, for example, that the unsteady-state solutions approach the steady-state solutions rapidly on the windward and leeward sides for alpha < and alpha sub c (approximately - 41 degrees). This is also so on the windward side for alpha > alpha sub c. On the leeward side for alpha > and alpha sub c, however, the unsteady boundary layer is initially unseparated but develops a region of reversed flow with increasing time. Subsequently, the streamwise displacement thickness develops a pronounced peak which leads to a singularity of the type observed by van Dommelen and Shen on a circular cylinder started impulsively from rest. Author (GRA)

N85-16070# Scientific Research Associates, Inc., Glastonbury, Conn.
DEVELOPMENT OF A NAVIER-STOKES ROTOR AND STATOR ANALYSIS Annual Report, 21 Jun. 1983 - 30 Jun. 1984
S. J. Shamroth, H. McDonald, B. C. Weinberg, and D. V. Roscoe Jun. 1984 39 p
(Contract F49620-83-C-0119)
(AD-A146967; SRA-R84-910004-1; AFOSR-84-0858TR) Avail: NTIS HC A03/MF A01 CSCL 20/4

An important problem in axial flow turbomachinery is that of flow through a turbine or compressor stage in which interaction occurs between the rotor and the stator. Although several experimental efforts have focused upon this problem, relatively little analysis has been applied to this problem. The present effort applies a Navier-Stokes analysis to the rotor/stator problem. The effort consists of several tasks. These include assessment of an existing Navier-Stokes analysis for time-dependent flows, exploration of appropriate boundary conditions, development of an appropriate coordinate system and a demonstration calculation. The present annual report discusses the time-dependent assessment, exploration of boundary conditions and the coordinate system problem. GRA

N85-16071# Naval Research Lab., Washington, D. C. Fluid Dynamics Branch.
FREE SURFACE EFFECTS ON THE WAKE OF A FLAT PLATE
T. F. Swean, Jr. and R. D. Peltzer 8 Nov. 1984 32 p
(AD-A146988; NRL-MR-5426) Avail: NTIS HC A03/MF A01 CSCL 20/4

Measurements of the mean velocity and the normal and tangential stresses in the wake of a rough flat plate near a free water surface are presented. The various distributions are compared with similar measurements taken in the wake of the plate when submerged in an effectively infinite fluid. The results reveal striking differences in the manner in which the wake evolves in the two instances. In contrast to the plane wake in an infinite fluid the present experiments show that in the proximity of a free surface the wake center line (defined as the point of maximum velocity defect) migrates toward the free surface. The regions of local maxima and minima typically found in free shear layer turbulence intensity distributions also show this behavior. In addition, both the mean velocity and the turbulent fluctuations decay at a slower rate near the free surface. The implications of the experimental results regarding appropriate free surface boundary conditions for computation are discussed. The equations of continuity and momentum are solved numerically together with equations for the turbulent kinetic energy and isotropic dissipation to complete a turbulence model. The computational model is verified for the infinite wake data. Boundary conditions to simulate the free surface are applied. The numerical results predict the major features which are observed experimentally near the free surface. Originator-supplied keywords include: Hot-film anemometry, Thin shear layer equations, Fluid mechanics, Spectral analysis, and Turbulence model. GRA

N85-16072# Naval Ship Research and Development Center, Bethesda, Md.
BULK CAVITATION CAUSED BY A PLANE SHOCK WAVE
B. M. Stow and J. D. Gordon Oct. 1984 22 p
(AD-A147031; DTNSRDC-84/047) Avail: NTIS HC A02/MF A01 CSCL 20/4

The bulk cavitation analysis method presented in this report eliminates the need to segment water for the purpose of solving simple equations of motion between water elements. The one-dimensional problem, analyzed in detail, demonstrates the ease of application of the method. Plots of cavitation closure, water pressure, and water particle velocity are provided from the analysis. The results of the one-dimensional analysis can be compared with results from other analytical methods to determine the differences. Originator supplied keywords include: Surface ship loading, cavitation closure depth, and cavitation closure time. GRA

N85-16073# Tennessee Univ. Space Inst., Tullahoma. Dept. of Aerospace and Mechanical Engineering.
CONTAMINATION AND DISTORTION OF STEADY FLOW FIELD INDUCED BY DISCRETE FREQUENCY IN AIRCRAFT GAS TURBINES Annual Report, 1 Jan. - 31 Dec. 1983
M. Kurosaka 16 May 1984 20 p
(Grant AF-AFOSR-0049-83)
(AD-A147092; AFOSR-84-0909TR) Avail: NTIS HC A02/MF A01 CSCL 20/4

This annual technical report covers the first year, Phase 1 activity of a research program initiated in January 1, 1983. The main objective of the present program is to investigate the influence of Reynolds stresses of organized origin induced by discrete frequency disturbances - in deforming and affecting the steady internal flow of aircraft engines. In particular, attention of the present research is focused upon the effect of orderly disturbances such as: (1) the vortex whistle upon the Ranque-Hilsch effects, and (2) Karman vortex street in causing temperature separation within the wake of bodies. GRA

N85-16074# Massachusetts Inst. of Tech., Cambridge. Gas Turbine and Plasma Dynamics Lab.
CURRENT PROBLEMS IN TURBOMACHINERY FLUID DYNAMICS Semiannual Report, 1 Nov. 1983 - 30 Apr. 1984
E. M. Greitzer, J. L. Kerrebrock, W. T. Tompkins, Jr., J. E. McCune, and A. H. Epstein Jun. 1984 106 p
(Contract F49620-82-K-0002)
(AD-A147127; AFOSR-84-0859TR) Avail: NTIS HC A06/MF A01 CSCL 20/4

A multi-investigator program on problems of current interest in

turbomachinery fluid dynamics is being conducted at the MIT Gas Turbine and Plasma Dynamics Lab. Within the scope of this effort, four different tasks, encompassing both design and off-design problems, have been identified. These are: (1) Investigation of fan and compressor design point fluid dynamics (including formation of design procedures using current three-dimensional transonic codes and development of advanced measurement techniques for use in transonic fans); (2) Studies of basic mechanisms of compressor stability enhancement using compressor casing/hub treatment; (3) Fluid mechanics of inlet vortex flow distortions in gas turbine engines; and (4) Investigations of three-dimensional analytical and numerical computations of flows in highly loaded turbomachinery blading. GRA

N85-16075# California Univ., Santa Cruz. Dept. of Mathematics.
DYNAMICAL CHARACTERISTICS OF WEAK TURBULENCE Annual Interim Technical Report, 1 Apr. 1983 - 31 Mar. 1984
J. Guckenheimer Aug. 1984 16 p
(Grant AF-AFOSR-0143-83)
(AD-A147186; AFOSR-84-0914TR) Avail: NTIS HC A02/MF A01 CSCL 20/4

This project is an exploration of dynamical features of chaotic physical systems with the emphasis upon turbulent fluids. The specific areas of investigation involve: (1) the development of techniques that discriminate measurable differences in the observed behavior of theoretical models for chaotic behavior, (2) the application of these techniques to experimental studies, and (3) the study of bifurcation behavior in multiparameter families of differential equations. The transition to chaotic behavior in fluids has received intense experimental study during the past ten years. Various routes to chaos have been studied, and a satisfying picture has emerged of how this transition proceeds in low dimensional dynamical systems. Our primary interest is in the behavior of a system after it has undergone the transition. Of central concern is the question of determining when low dimensional chaotic models provide a good description of the physical system. GRA

N85-16076# Wisconsin Univ., Madison. Mathematics Research Center.
ON THE ASYMPTOTIC ANALYSIS OF TRAVELLING SHOCKS AND PHASE BOUNDARIES IN ELASTIC BARS Technical Summary Report
T. J. Pence Aug. 1984 20 p
(Contract DAAG29-80-C-0041; Grant NSF MCS-82-10950)
(AD-A147239; MRC-TSR-2731) Avail: NTIS HC A02/MF A01 CSCL 20/11

This paper is concerned with the propagation of shocks and phase boundaries in elastic bars. We consider materials for which the one-dimensional stress response is piecewise linear and not monotonic. In the presence of an applied load the dynamical fields are described by a set of functional equations. These equations are treated asymptotically for a model problem involving a load which approaches a constant value. The dynamical fields approach the solution given by a corresponding Riemann problem at a rate t to the minus n power where $n < -2$ is given in terms of the stress response. GRA

N85-16077# Wisconsin Univ., Madison. Mathematics Research Center.
EXISTENCE OF SLOW STEADY FLOWS OF VISCOELASTIC FLUIDS WITH DIFFERENTIAL CONSTITUTIVE EQUATIONS Technical Summary Report
M. Renardy Aug. 1984 15 p
(Contract DAAG29-80-C-0041; Grant NSF MCS-82-10950)
(AD-A147240; MRC-TSR-2730) Avail: NTIS HC A02/MF A01 CSCL 12/1

Questions of existence and uniqueness of steady flows of viscoelastic fluids have thus far not been understood, even for slow flows perturbing rest. This paper provides an existence result for slow flows with no in- and outflow boundaries. The fluid is assumed to be described by constitutive equations of a differential nature. The method used to prove existence is constructive and in fact very close to procedures used in numerical calculations. GRA

N85-16078*# Stanford Univ., Calif. Center for Large Scale Scientific Computation.
HIGH MARANGONI NUMBER CONVECTION IN A SQUARE CAVITY
A. Zebib, G. M. Homsy, and E. Meiburg 31 May 1984 44 p
(Contracts NAS8-33881; N00014-82-K-0335)
(NASA-CR-174283; NAS 1.26:174283; AD-A147256; SU-CLASSIS-84-06) Avail: NTIS HC A03/MF A01 CSCL 20M

We consider the steady thermocapillary motion in a square cavity with a top free surface in the absence of gravitational forces. The cavity is heated from the side with the vertical boundaries isothermal while the horizontal boundaries are adiabatic. The relative change in the surface tension is very small, i.e., an appropriate capillary number tends to zero, so that the free surface is assumed to remain flat at leading order. A finite difference method is employed to compute the flow field. Numerically accurate solutions are obtained for a range of Prandtl numbers and for Reynolds numbers as high as 5 x 1000. Surface deflections are computed as a domain perturbation for small capillary number. In addition, asymptotic methods are used to infer the bounary layer structure in the cavity, in the limit of large values of the Reynolds number Re and the Marangoni number Ma. GRA

N85-16079# Naval Postgraduate School, Monterey, Calif.
HEAT TRANSFER DUE TO FILM CONDENSATION ON VERTICAL FLUTED TUBES Final Report, Jan. - Sep. 1983
V. K. Garg and P. J. Marto Jul. 1984 65 p
(AD-A147258; NPS69-84-006) Avail: NTIS HC A04/MF A01 CSCL 13/1

An analysis of film condensation on a vertical fluted tube has been made considering gravitational and surface tension effects over the entire fluted surface, and using surface-oriented coordinates. For the first time surface tension effects are determined, as they should, from the shape of the condensate-vapor interface rather than the shape of the flute. Two-dimensional conduction within the condensate film as well as in the fluted tube is considered. A finite-difference solution of the highly non-linear partial differential equation for the film thickness is coupled with a finite-element solution of the condition problem. The procedure has been tested on a sinusoidal flute with amplitude to pitch ratio approx. 0.2. A linear extrapolation, on a log-log basis, of our results shows good comparison with experimental data. GRA

N85-16080# Wisconsin Univ., Madison. Mathematics Research Center.
THE RESISTANCE AND MOBILITY FUNCTIONS OF TWO EQUAL SPHERES IN LOW REYNOLDS NUMBER FLOW Technical Summary Report
S. Kim and R. T. Mifflin Aug. 1984 65 p
(Contract DAAG29-80-C-0041)
(AD-A147301; MRC-TSR-2735) Avail: NTIS HC A04/MF A01 CSCL 20/4

The resistance and mobility functions which completely characterize the linear relations between the force, torque and stresslet and the translational and rotational velocities of two spheres in low-Reynolds-number flow have been calculated using a boundary collocation technique. The ambient velocity field is assumed to be a superposition of a uniform stream and a linear (vorticity and rate-of-strain) field. This is the first compilation of accurate expressions for the entire set of functions. Our calculations are in agreement with earlier results for which such results are available. Our technique is successful at all sphere-sphere separations except at the almost-touching (gaps of less than .005 diameter) configuration. New results for the stresslet functions have been sued to determine Batchelor and Green's (1972) order c square coefficient in the bulk-stress (7.1 instead of 7.6). The two-sphere functions have also been used to determine the motion of a rigid dumbbell in a linear field. We also show that certain

functions have extrema. The source (FORTRAN) code is furnished in the appendix. GRA

N85-16081# Wisconsin Univ., Madison. Mathematics Research Center.
STABILITY OF RIGID MOTIONS AND ROLLERS IN BICOMPONENT FLOWS OF IMMISCIBLE LIQUIDS Technical Summary Report
D. D. Joseph, Y. Renardy, M. Renardy, and K. Nguyen Aug. 1984 30 p
(Contracts DAAG29-80-C-0041; DAAG29-82-K-0051; Grants NSF MCS-82-10950; NSF MCS-82-15064)
(AD-A147302; MRC-TSR-2740) Avail: NTIS HC A03/MF A01 CSCL 12/1

The authors study the stability of flows of two immiscible fluids between two cylinders rotating at the same frequency. They show that this problem can be reduced to the minimization of a certain functional. Necessary and sufficient conditions for the stability of centrifuged configurations with the heavier fluid on the outside, are given. It is shown that the viscosity plays no role in the stability problem. This is different from shearing flows between rotating cylinders, where it is in fact possible to have the heavier fluid inside. GRA

N85-16082# Wisconsin Univ., Madison. Mathematics Research Center.
SEDIMENTATION OF TWO ARBITRARILY ORIENTED SPHEROIDS IN A VISCOUS FLUID Technical Summary Report
S. Kim Aug. 1984 36 p
(Contract DAAG29-80-C-0041)
(AD-A147303; MRC-TSR-2739) Avail: NTIS HC A03/MF A01 CSCL 20/11

The translational and rotational motions of two prolate spheroids sedimenting in a viscous fluid have been determined by the method of reflections. No restrictions are imposed on the spheroid orientations or relative sizes. As is the case in many mobility problems, the method converged rapidly for all but almost touching configurations. The results extend earlier work on special cases such as Wakiya's work on horizontal orientations and agree with Gluckman, et. al., and Liao and Krueger's boundary collocation solution of axisymmetric problems. Analysis of sedimentation with inclined axes and mirror symmetric geometry reveal both periodic and single-encounter particle trajectories. The calculation of the separatrix between the two behaviors required the use of the higher reflections introduced in this work. GRA

N85-16083# Iowa Univ., Iowa City. Inst. of Hydraulic Research.
FREE-SURFACE BOUNDARY LAYER AND THE ORIGIN OF BOW VORTICES Technical Report, Jan. 1983 - Sep. 1984
V. C. Patel, L. Landweber, and C. J. Tang Oct. 1984 29 p
(Contract N00014-83-K-0136)
(AD-A147427; IIHR-284) Avail: NTIS HC A03/MF A01 CSCL 20/4

The boundary layer that exists due to the boundary conditions at a curved free surface of a viscous liquid ahead of a body in motion is analyzed. It is shown that surface tension and viscous effects are important and together explain the occurrence of vortices which have been observed on ship bows. The equations of the free-surface boundary layer have been derived and an integral method has been suggested for their solution.
Author (GRA)

N85-16084# Stanford Univ., Calif. Center for Large Scale Scientific Computation.
LAMINAR FLOW OVER A BACKWARD-FACING STEP
A. Zebib and G. M. Homsy Sep. 1984 28 p
(Contract N00014-82-K-0335)
(AD-A147469; SU-CLASSIC-84-07) Avail: NTIS HC A03/MF A01 CSCL 20/4

The steady, two-dimensional flow of an incompressible fluid over a backward-facing step is computed by a finite difference procedure. The flow depends upon the Reynolds number, Re, based on the inlet flow conditions, and on the dimensionless step height, s. Spatially resolved, accurate solutions are obtained for a range of s for Reynolds numbers as high as 350. The primary flow feature is a steady separated region immediately in back of the step. Additionally, a secondary separated vortex can appear on the top, straight wall of the channel. A region is delineated in the (s,Re) plane where laminar separation occurs on the top surface. It is concluded that there is no flow reversal on the top surface if Re is less than about 200, regardless of the step height s. The occurrence of this secondary vortex is associated with laminar separation of the top boundary layer produced by an adverse pressure gradient along the top of the channel. GRA

N85-16085# Aeronautical Research Associates of Princeton, Inc., N. J.
AN ANALYTICAL MODEL OF PERIODIC WAVES IN SHALLOW WATER
H. Segur and A. Finkel Jul. 1984 74 p Prepared in cooperation with IBM Watson Research Center, Yorktown Heights, N.Y.
(Contract N00014-80-C-0048)
(AD-A147501; ARAP-TM-84-12) Avail: NTIS HC A04/MF A01 CSCL 12/1

An explicit, analytical model is presented of finite amplitude waves in shallow water. The waves in question have two independent spatial periods, in two independent horizontal directions. Both short-crested and long-crested waves are available from the model. Every wave pattern is an exact solution of the Kadomtsev-Petviashvill equation, and is based on a Riemann theta function of genus 2. These bi-periodic waves are direct generalizations of the well-known (simply periodic) cnoidal waves. Just as cnoidal waves are often used as one-dimensional models of typical nonlinear, periodic waves in shallow water, these bi-periodic waves may be considered to represent typical nonlinear, periodic waves in shallow water without the assumption of one-dimensionality.
Author (GRA)

N85-16086# Aeronautical Research Associates of Princeton, Inc., N. J.
AN ANALYTICAL MODEL OF PERIODIC WAVES IN SHALLOW WATER Summary Report
H. Segur and A. Finkel 1984 13 p Presented at the Army 2nd Conf. on Appl. Math. and Computing, Troy, N.Y., 22-25 May 1984 Sponsored in part by Army Prepared in cooperation with IBM Watson Research Center, Yorktown Heights, N.Y.
(Contract N00014-80-C-0048; Grant NSF MCS-81-08814)
(AD-A147502) Avail: NTIS HC A02/MF A01 CSCL 20/4

An analytical model is presented of finite amplitude waves in shallow water. The waves discussed have two independent spatial periods, in two independent horizontal directions. Both short-crested and long-crested waves are available from the model, and every wave pattern is an identical solution of the Kadomtsev-Petviashvili equation, based on a Riemann theta function of genus 2. These bi-periodic waves are direct generalizations of the well-known (simply periodic) cnoidal waves. Just as cnoidal waves are often used as one-dimensional models of typical nonlinear, periodic waves in shallow water, these bi-periodic waves may be considered to represent typical nonlinear, periodic waves in shallow water without the assumption of one-dimensionality. GRA

N85-16087# McDonnell-Douglas Corp., Long Beach, Calif.
SOME IMPORTANT PROBLEMS IN UNSTEADY BOUNDARY LAYERS INCLUDING SEPARATION. 1: NATURE OF SINGULARITY ON OSCILLATING AIRFOILS Annual Report
T. Cebeci, A. A. Khattab, and S. M. Schimke Apr. 1984 19 p
(Contract F49620-82-C-0055)
(AD-A147897; MDC-J2990; AFOSR-84-1066TR) Avail: NTIS HC A02/MF A01 CSCL 20/4

Preliminary results are presented for the analysis of unsteady laminar boundary layers on oscillating airfoils. An examination of the evolution of the boundary layer near the nose of an oscillating airfoil has revealed that, when the reduced frequency is of the same order as in experiments on dynamic stall, the unsteady boundary layer ceases to behave in a smooth manner just

downstream of separation and before one cycle is completed. As for the case of the implusively started circular cylinder, the irregular behavior signals the onset of a singularity in the solution of the boundary layer equations. Numerical results for the method are compared with the numerical results of van Dommelen and Shen for the impulsively started circular cylinder, the irregular behavior signals the onset of a singularity in the solution of the boundary layer equations. Numerical results for the method are compared with the numerical results of van Dommelen and Shen for the impulsively started circular cylinder. GRA

N85-16088# California Univ., Santa Barbara. Dept. of Mechanical and Environmental Engineering.
CONVECTION HEAT TRANSFER IN THE CRITICAL REGION OF FLUID MIXTURES Progress report
Ekkehard Marschall Sep. 1984 14 p
(Contract DE-AT03-84ER-13164)
(DE85-002118; DOE/ER-13164/T1) Avail: NTIS HC A02/MF A01

An experimental apparatus for measuring heat transfer rates and heat transfer coefficients in the critical region of pure fluids and fluid mixtures was constructed and testing of the apparatus was begun. Tests to ensure precise measurements of the heat transfer rates and related parameters are planned. DOE

N85-16089# National Bureau of Standards, Washington, D.C. Center for Applied Mathematics.
FINITE DIFFERENCE CALCULATIONS OF BUOYANT CONVECTION IN AN ENCLOSURE. PART 2: VERIFICATION OF THE NONLINEAR ALGORITHM Final Report
R. G. Rehm, H. Baum, P. D. Barnett, and D. M. Corley Sep. 1984 36 p refs
(PB85-104065/GAR; NBSIR-84/2932-Pt-2) Avail: NTIS HC A03/MF A01 CSCL 20D

Earlier, a mathematical model of buoyant convection in an enclosure was developed. The nonlinear equations constituting this model recently were solved by finite difference methods in two dimensions. Two solutions, obtained in special cases, to the model equations are presented. For both cases the solutions to the partial differential equations and to the finite difference equations used to approximate the differential equations are obtained by combinations of analytical and numerical techniques. GRA

N85-16090# National Bureau of Standards, Washington, D.C. Center for Chemical Engineering.
NUMERICAL SOLUTIONS FOR STEADY NATURAL CONVECTION IN A SQUARE CAVITY Final Report
E. F. Moore and R. W. Davis Mar. 1984 34 p refs
(PB84-245752; NBSIR-84/2830) Avail: NTIS HC A03/MF A01 CSCL 20D

Numerical solutions have been obtained for steady natural convection in a square cavity. The numerical method used was developed for unsteady incompressible, viscous fluid flow. The similarity parameters were chosen to match those of an international comparison exercise. Results are presented and compared with those obtained by other researchers using different methods. Author (GRA)

35 INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see *43 Earth Resources.* For related information see also *06 Aircraft Instrumentation,* and *19 Spacecraft Instrumentation.*

N85-16091 United Kingdom Atomic Energy Authority, Risley (England). Lab. de Mesure et d'Instrumentation.
ACOUSTIC TRANSDUCERS FOR FAST REACTOR INSTRUMENTATION
C. Lhuillier 27 Jun. 1984 14 p refs Transl. into ENGLISH of conf. paper "Capteurs Acoustiques pour l'Instrumentation des Reacteurs", 1984 Presented at Capteurs '84, Paris, 4-7 Jun. 1984
(BLL-Risley-Tr-4979-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

Acoustic devices installed in the primary vessel of fast reactors are of great interest in the general field of power station operating safety. A lithium niobate ultrasonic transducer covering a wide range of temperatures (0 to 600 C) and frequencies (0 to 5 MHz) was developed to improve the quality of these instruments which up till now were able to avoid the effects of the hostile environment through the use of wave guides. Author

N85-16092 United Kingdom Atomic Energy Authority, Dounreay (Scotland).
COMPARISON MEASUREMENTS ON OPTICAL PARTICLE COUNTERS
J. Gebhart, P. Blakenberg, S. Bormann, and C. Roth 7 Jun. 1984 22 p refs Transl. into ENGLISH from Staub Reinhalt Luft 43 (West Germany), no. 11, 11 Nov. 1984 p 439-447
(BLL-Dounreay-Tr-934-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

Eleven optical particle counters including eight types of instruments from five different manufacturers were investigated experimentally with regard to their counting efficiency and classification properties. The investigations were carried out with monodisperse aerosols of polystyrene-latex particles (refractive index 1.59) and with oil droplets (refractive index 1.45). For characterizing the test aerosols, independent methods such as electron microscopy and sedimentation spectroscopy were applied. Two scattered light aerosol spectrometers from the laboratory which were checked independently by an electrostatic aerosol sampler served as concentration measuring devices as reference apparatus for the actual concentration number. During an experimental run all the devices simultaneously sampled the aerosol from a 300 liter vessel which was continuously supplied with a continuous stream of aerosol and air dilutent. In the sub-micron regime the counting efficiency of most of the instruments decreased constantly with decreasing particle size so that the lower limit of detection is a gradual transition rather than a sudden threshold. In the micron regime the results were satisfactory for counting efficiency. Particles of 2 micro m diameter and above, using instruments with low volumetric flow, may however already be present in the sampler thus further reducing the counting efficiency. B.W.

N85-16093 Department of the Navy, Washington, D. C.
FAST GRANULAR SUPERCONDUCTING BOLOMETER Patent
S. A. Wolf, U. Strom, and K. Weiser, inventors (to Navy) Issued 7 Aug. 1984 7 p Supersedes AD-D010186
(AD-D011332; US-Patent-4,464,065; US-Patent-Appl-SN-406428; US-Patent-Class-374-121) Avail: US Patent and Trademark Office CSCL 09/3

This abstract discloses a granular superconducting thin film bolometer made by anodizing a thin film of such materials as niobium nitride to form a thin granular film separated by and covered with the anodized oxide. The bolometer is cooled to its superconducting state and electrically connected to a biasing and detecting network. Its temporal response is better than 1 ns. GRA

N85-16094 Department of the Navy, Washington, D. C.
AMPLITUDE MODE MAGNETIC SENSORS Patent
T. G. Giallorenzi, inventor (to Navy) Issued 11 Sep. 1984 7 p Supersedes AD-D009367
(AD-D011335; US-Patent-4,471,219; US-Patent-Appl-SN-355952; US-Patent-Class-250-227) Avail: US Patent and Trademark Office CSCL 17/6

This invention relates generally to devices for detecting very small magnetic fields, and more particularly, to devices for detecting such small magnetic fields by means of amplitude mode sensing. GRA

N85-16095*# Smithsonian Astrophysical Observatory, Cambridge, Mass.
RESEARCH RELATIVE TO THE DEVELOPMENT OF A CRYOGENIC MICROWAVE CAVITY GRADIOMETER FOR ORBITAL USE Semiannual Report, 1 Jul. - 31 Dec. 1984
Mario D. Grossi Dec. 1984 34 p refs
(Grant NAG5-338)
(NASA-CR-174249; NAS 1.26:174249; SAR-3) Avail: NTIS HC A03/MF A01 CSCL 14B

The noncryogenic, single axis, gravity gradiometer which is characterized by a sensitivity of the order of 10 to the minus 2 power Eovos Units in a few sec integration time was investigated. The prototype of testing gradiometer on the earth surface by the free fall in vacuo method was expanded. An existing free fall tower facility and the possibility of adding inside the falling elevator cabin an air tight, sealed, cylindrical container with inside pressure < or = -0.001 Torr were examined to test the gradiometer in free fall conditions inside this evacuated container. Earth's gravity anomalies are simulated with masses of suitable shape, weight, and location. The attitude of the falling gradiometer is monitored by a three axis gyro package mounted on the instrument package. It is concluded that the free fall testing of the gradiometer is both feasible and practical. E.A.K.

N85-16096*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH TEMPERATURE THERMOCOUPLE AND HEAT FLUX GAUGE USING A UNIQUE THIN FILM-HARDWARE HOT JUNCTURE
Curt H. Liebert, Raymond Holanda, Steven A. Hippensteele, and Charles A. Andracchio Dec. 1984 29 p refs Proposed for presentation at 30th Intern. Gas Turbine Conf. and Exhibition, Houston, Tex., 17-21 Mar. 1985; sponsored by ASME
(NASA-TM-86898; E-2365; NAS 1.15:86898) Avail: NTIS HC A03/MF A01 CSCL 14B

A special thin film-hardware material thermocouple (TC) and heat flux gauge concept for a reasonably high temperature and high flux flat plate heat transfer experiment was fabricated and tested to gauge temperatures of 911 K. This concept was developed for minimal disturbance of boundary layer temperature and flow over the plates and minimal disturbance of heat flux through the plates. Comparison of special heat flux gauge Stanton number output at steady-state conditions with benchmark literature data was good and agreement was within a calculated uncertainty of the measurement system. Also, good agreement of special TC and standard TC outputs was obtained and the results are encouraging. Oxidation of thin film thermoelements was a primary failure mode after about 5 of operation. Author

N85-16097# Aeronautical Research Labs., Melbourne (Australia).
THE CONSTANT CURRENT STRAIN GAUGE BRIDGE
E. S. Moody Jul. 1984 36 p refs
(ARL-Struc-TM-385; AR-003-948) Avail: NTIS HC A03/MF A01

A simplified analysis is used to develop expressions for the output of the commonly used strain gauge bridge configurations with constant current excitation. Expressions for initial offset compensation, shunt calibration and the influence of lead resistance are developed. Consideration is given to some means for error correction. Author

N85-16098*# ITT Aerospace/Optical Div., Fort Wayne, Ind.
STEREO ELECTRO-OPTICAL TRACKING SYSTEM (SETS) Final Report
Edward W. Koenig et al Sep. 1984 47 p
(Contract NAS1-16883)
(NASA-CR-172471; NAS 1.26:172471; Rept-61270-10) Avail: NTIS HC A03/MF A01 CSCL 14B

The SETS is a remote, non-contacting, high-accuracy tracking system for the measurement of deflection of models in the National Transonic Facility at Langley Research Center. The system consists of four electronically scanned image dissector trackers which locate the position of Light Emitting Diodes embedded in the wing or body of aircraft models. Target location data is recorded on magnetic tape for later 3-D processing. Up to 63 targets per model may be tracked at typical rates of 1280 targets per second and to precision of 0.02mm at the target under the cold (-193 C) environment of the NTF tunnel. Author

N85-16099*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF FIVE LUBRICANTS ON LIFE OF AISI 9310 SPUR GEARS
Dennis P. Townsend and Erwin V. Zaretsky Jan. 1985 15 p refs
(NASA-TP-2419; E-2183; NAS 1.60:2419) Avail: NTIS HC A02/MF A01 CSCL 13I

Spur-gear surface fatigue tests were conducted with five lubricants using a single lot of consumable-electrode vacuum melted (CVM) AISI 9310 spur gears. The lot of gears was divided into five groups, each of which was tested with a different lubricant. The test lubricants are classified as either a synthetic hydrocarbon, mineral oil, or ester-based lubricant. All five lubricants have imilar viscosity and pressure-viscosity coefficients. A pentaerythritol base stock without sufficient antiwear additives produced a surface fatigue life approximately 22 percent that of the same base stock with chlorine and phosphorus type additives. The presence of sulfur type antiwear additives in the lubricant did not appear to affect the surface fatigue life of the gears tested. No statistical difference in the 10-percent surface fatigue life was produced with four of the five lubricants. Author

N85-16100*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INTEGRATED EXHAUST GAS ANALYSIS SYSTEM FOR AIRCRAFT TURBINE ENGINE COMPONENT TESTING
Robert L. Summers and Robert C. Anderson Jan. 1985 28 p refs
(NASA-TP-2424; E-2302; NAS 1.60:2424) Avail: NTIS HC A03/MF A01 CSCL 14B

An integrated exhaust gas analysis system was designed and installed in the hot-section facility at the Lewis Research Center. The system is designed to operate either manually or automatically and also to be operated from a remote station. The system measures oxygen, water vapor, total hydrocarbons, carbon monoxide, carbon dioxide, and oxides of nitrogen. Two microprocessors control the system and the analyzers, collect data and process them into engineering units, and present the data to the facility computers and the system operator. Within the design of this system there are innovative concepts and procedures that are of general interest and application to other gas analysis tasks. Author

N85-16101*# Morgan State Univ., Baltimore, Md.
THE CALIBRATION OF PHOTOGRAPHIC AND SPECTROSCOPIC FILMS: A DENSITOMETRIC ANALYSIS OF IIaO FILM FLOWN ABOARD THE SPACE SHUTTLE 3 Semiannual Report, Jan. - Dec. 1982
Ernest C. Hammond, Jr., Al Stobor, and Kevin Peters Dec. 1984 20 p ref
(Grant NsG-5074)
(NASA-CR-174278; NAS 1.26:174278) Avail: NTIS HC A02/MF A01 CSCL 14E

Three canisters of IIaO film were prepared along with packets of color film from the National Geographic Society, which were placed on the Space Shuttle. The ultimate aim was to obtain reasonably accurate data concerning the background fogging effects as related to the total environment experience of the film including the groundbased packing and loading of the film from Goddard Space Flight Center to Cape Kennedy. The affects of solar wind, humidity, cosmic rays, the Van Allen Belt radiation exposure, various thermal effects, and reentry and off-loading of the film during takeoff and 8 days, 3 hour 15 minute orbit are of particular interest. B.G.

N85-16102# Royal Observatory, Edinburgh (Scotland).
ASTRONOMICAL PHOTOGRAPHY 1984

M. Elizabeth Sim, ed. and Keiichi Ishida, ed. 1984 315 p refs Proc. of IAU Working Group on Phot. Probl., Edinburgh, 4-6 Apr. 1984
(ROE-OR-14; ISBN-0-902553-31-3; ISSN-0309-099X) Avail: NTIS HC A15/MF A01

Ground-based astronomical photography material and research were discussed. Sensitometry; hypersensitization of emulsions; emulsion properties; photographic techniques; plate calibration; measurement and data reduction; and applications in stellar photometry were considered. For individual titles, see N85-16103 through N85-16137.

N85-16103# Kitt Peak National Observatory, Tucson, Ariz.
RECALIBRATION OF THE KPNO SPOT SENSITOMETERS
W. E. Schoening and C. Nink *In* Royal Observatory Astron. Phot. 1984 1984 p 1-9 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Two techniques for calibrating spot sensitometers are described. The first method involves a comparison of the wedge to a spot box with an accurately known source, but it is too time consuming. The second method uses a GaAs photomultiplier in a cold box, with light from the sensitometer being transmitted to the box via a fiber optic probe. This enables direct measurement of intensity, eliminating the need for photographic methods. Comparison of UV calibration of original calibration data and recalibration data reveals significant differences, with the recalibration being as accurate as possible with these sensitometers. Author (ESA)

N85-16104# Florida Univ., Gainesville. Dept. of Astronomy.
FLACS: A NEW SENSITOMETER FOR MEASUREMENT OF EXTREME LOW INTENSITY RECIPROCITY IN A CONTROLLED ENVIRONMENT
Alex G. Smith and Hans W. Schrader *In* Royal Observatory Astron. Phot. 1984 1984 p 11-15 refs (For primary document see N85-16102 07-35)
(Grant NSF AST-82-03926)
Avail: NTIS HC A15/MF A01

A compact sensitometer that facilitates exposures as long as a week in a fully lighted laboratory and in a completely controlled atmosphere was developed. The instrument can readily be placed in a refrigerator, freezer, or oven for temperature control. It is used in experiments to see if the hypersensitization techniques developed by astronomers can be used to suppress low intensity reciprocity failure (LIRF) in medical X-ray films. At minus 24 C LIRF is reduced, at minus 85 C it is nearly eliminated. Hypersensitization by baking for 140 min in hydrogen at 65 C greatly suppresses LIRF, even at room temperature. Author (ESA)

N85-16105# Centre d'Etudes et de Recherches Geodynamiques et Astronomiques, St. Vallier de Thiey (France).
SENSIT.FOR: A PROGRAM FOR SENSITOMETRIC REDUCTION
A. Maury and J. Marchal (Observatoire de Nice) *In* Royal Observatory Astron. Phot. 1984 Sep. 1984 p 17-20 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A FORTRAN program for sensitometric evaluation of processes involved in hypering astronomical plates was written. It contains subroutines for full or quick description of the operation being done; choice of type of sensitogram; creation of 16 subfiles in the scan; density filtering; correction for area; specular PDS to diffuse ISO density calibration; and fog correction. Author (ESA)

N85-16106# Ceskoslovenska Akademie Ved, Ondrejov. Inst. of Astronomy.
A SPECTROSENSITOMETER WITH AN ABSOLUTE CALIBRATION
O. Zichova, J. Zicha, and J. Honsa *In* Royal Observatory Astron. Phot. 1984 1984 p 21-30 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A portable prism spectrosensitometer with an absolute calibration was designed for evaluation of the spectral sensitivity of photographic materials used in astronomy. The spectral region from 380 to 880 nm is covered and it is possible to place one, two or three exposures on one sample. An easy measurement of reciprocity characteristics and a quick check of hypersensitizing procedures are also possible. Author (ESA)

N85-16107# Shanghai Observatory (China).
COMPARISON OF THE FINE GRAIN COMPENSATION HYPERSENSITIZATION (FAH) PROCESS WITH GAS HYPERSENSITIZING TECHNIQUES
Yao Bao-an, Jing Jia-yun, Xu Zong-hai, and Tong Jian-hua (Beijing Observatory) *In* Royal Observatory Astron. Phot. 1984 1984 p 35-43 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The gas hypersensitization and fine grain compensation (FAH) process for treating astronomical photography plates were tested on the same emulsion. A sensitivity increase with FAH of 3.6, developed 6 days after treatment, and 3.2, for 3 days after is achieved for emulsion IIIa-J. For coarse grain plates, FAH results are inferior to gas hypersensitizing. Tests of the effects of moist air show that a nitrogen filled plateholder is needed for both processes. Combination of FAH with gas hypersensitizing is discussed. Author (ESA)

N85-16108# Abastumani Astrophysical Observatory, Georgia (USSR).
THE RESULTS OF HYDROGEN HYPERSENSITIZATION OF PHOTOEMULSIONS
R. I. Kildadze, V. B. Natriashvili, and D. G. Chipashvili *In* Royal Observatory Astron. Phot. 1984 1984 p 45-52 ref (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Hydrogen hypersensitized and non hydrogen hypersensitized emulsions were compared. Results show that hydrogen hypersensitization increases the sensitivity for most of the emulsions when exposed for a long time. In so doing, it is possible to use nonastronomical emulsions, which can be kept properly and have a suitable resolving power, for astronomical purposes. Kodak 2415 and Soviet Pf-3 emulsions are suitable. Author (ESA)

N85-16109# Royal Observatory, Edinburgh (Scotland). Telescope Unit.
NITROGEN FLUSHING DURING EXPOSURE OF LARGE SCHMIDT TELESCOPE PLATES
J. A. Dawe, E. Coyte, and N. Metcalfe (Durham Univ.) *In its* Astron. Phot. 1984 1984 p 59-67 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Hypersensitized plates taken on a Schmidt telescope before and since the use of nitrogen-flushing during exposure were compared. Substantial improvements are found in large-scale and point-to-point variations in plate uniformity as a result of nitrogen flushing. Plate exposure times are slightly reduced, though such reductions are of the same level as variations found between Kodak batches. The difficulties in ensuring the smooth flow of dry nitrogen over plates as large as 14 in are very great. However, the resulting gains in uniformity and, hence, potential photometric accuracy are extremely beneficial. Author (ESA)

N85-16110# Royal Observatory, Edinburgh (Scotland).
THE MOST EFFECTIVE ASTRONOMICAL PHOTOGRAPHIC EMULSIONS FOR RECORDING OF FAINT AND LOW-CONTRAST OBJECTS
M. F. Shabanov (Special Astrophysical Observatory, Stavropolskij, Kraj, USSR) *In its* Astron. Phot. 1984 1984 p 69-81 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

After exposure, measurement and computer processing of > 400 samples of astronomical photographic emulsions, 9 of the most effective were selected. The averaged data of their characteristic curves, spectral sensitivity, noise, and gradation characteristics are presented. Their properties and application features in

astronomical observations are discussed. The most sensitive emulsion at 450 nm wavelength is A-500 Y. Author (ESA)

N85-16111# Crimean Astrophysical Observatory (USSR).
ASTRONOMICAL APPLICATIONS OF NEW INFRARED FILMS
A. S. Heinman (Scientific Inst. Chimphotoproject), B. I. Shapiro (Scientific Inst. Chimphotoproject), A. G. Scherbakov, and N. I. Shakhovskaya *In* Royal Observatory Astron. Phot. 1984 1984 p 83-88 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

High speed infrared films for astronomical photography which do not require hypersensitization, and which can be transported for 30 to 40 hr at 20 C without changing their characteristics were produced. The films were used to investigate the fine structure of the solar chromosphere and to detect cyclic changes in the outer atmosphere of 2 Aur B. Author (ESA)

N85-16112# Royal Observatory, Edinburgh (Scotland).
THE 3a-F EMULSION AND THE QUASAR REDSHIFT CUT-OFF
Ann Savage *In its* Astron. Phot. 1984 1984 p 89-92 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The disadvantages of searching for broad emission line objects on an emulsion whose sensitivity peaks mimic those emission features are outlined. The IIIa-F emulsion was used with UK Schmidt telescope plates to find high red shift quasars ($z>3$). Far fewer objects than expected from extrapolations of low red shift data were found, since the Lyman alpha emission feature of the high red shift quasar is not as prominent as that for low shift due to the irregular sensitivity response of the emulsion. A 4 m telescope, IIIa-F survey also failed to find the expected number of high red shift quasars. The emission lines used to identify the objects are near the sensitivity peaks of the emulsion, and no objects are detected where emulsion sensitivity drops by 0.5 mag (6000 to 6500 A). Author (ESA)

N85-16113# Royal Observatory, Edinburgh (Scotland).
MICROSPOTS ON SPECTROSCOPIC PLATES
A. R. Good and G. Gourlay *In its* Astron. Phot. 1984 1984 p 93-106 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Inspections of Schmidt telescope IIIa-J emulsion plates show many of these plates to be affected by microspot blemishes. Tests suggest environmental and processing causes. Contrary to manufacturers recommendations, the introduction of iodide into the processing line may be beneficial rather than detrimental to spot formation. Author (ESA)

N85-16114# Anglo-Australian Observatory, Sydney.
WHERE TO NEXT IN ASTRONOMICAL PHOTOGRAPHY?
D. F. Malin *In* Royal Observatory Astron. Phot. 1984 1984 p 111-118 (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The application of tabular grain emulsions in monochrome low light level astronomical photography is discussed. The speed gain of a mixed halide, e.g., an iodobromide IIIa emulsion, would be useful, and mixed halides may eliminate microspots. Tabular grain technology allows a large increase in blue sensitivity, and this advantage could be extended to V and R bands. The high surface area of tabular grains should favor rapid and efficient hydrogen hypering, but emulsions must be designed to assure ready access of hydrogen to all grains equally. Development of a J or O dye-sensitized emulsion with hypered speed no slower than IIIa-J but with gamma D=1 of 5 to 7 is advocated. Author (ESA)

N85-16115# Royal Observatory, Edinburgh (Scotland).
WHAT DO WE WANT: INCREASED SPEED, RESOLUTION, CONTRAST OR DOE?
R. D. Cannon *In its* Astron. Phot. 1984 1984 p 119-133 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Application of tabular grain emulsions to astronomical photography with large Schmidt telescopes is discussed. The greatest astronomical gains would come from a finer grain emulsion, but with speed no slower than that of IIIa emulsions, especially when used on large Schmidt telescopes. Any new emulsion should be designed with the requirements of fast automatic plate measuring machines in mind; for example the best way of reaching faint limits should be by adding data from many separate plates, each exposed to the density which maximizes the DOE. There are practical advantages in having simply a faster version of IIIa-J preferably with a range of other spectral sensitizations for relatively slow telescopes with large plate scales, or for small telescopes with imperfect guiding systems. Author (ESA)

N85-16116# Royal Observatory, Edinburgh (Scotland).
SOME ASPECTS OF PHOTOGRAPHY WITH A SMALL SCHMIDT CAMERA
Cedrick R. Martys *In its* Astron. Phot. 1984 1984 p 135-141 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Observational and darkroom techniques used with a 0.35 m, f 2.9 Schmidt camera are described. Kodak 2415 film, hypersensitized by 2.5 hr in dry nitrogen at 65 C followed by 5 min in 100% hydrogen is used. Faint features are printed using superimposed negatives. High contrast copies are made using Kodak LPD7 film. The LPD7 prints are copied onto equidensity film to study gas density gradients in galaxies and nebulae. High contrast, full color saturated prints are produced from monochrome positive copies by exposing the copy transparencies through filters onto Cibabhrome A2 paper, and applying dodging and shading techniques. Author (ESA)

N85-16117# European Southern Observatory, Garching (West Germany).
SOME NONATLAS WORK AT THE EUROPEAN SOUTHERN OBSERVATORY (ESO) SKY ATLAS LABORATORY
Claus Madsen *In* Royal Observatory Astron. Phot. 1984 1984 p 143-152 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Black and white and color astronomical photography at the European Southern Observatory is described. For black and white copying, unsharp masking, diffuse light amplification (DLA), and integrated printing are used. To reduce noise in DLA plate surfaces, several enhanced derivatives are printed together. Color photographs are produced by contact printing. The application of false color composites for fast location of excess UV objects is described. Author (ESA)

N85-16118# Kitt Peak National Observatory, Tucson, Ariz.
USING A GOSSEN LIGHT METER TO PRODUCE ENLARGED INTERPOSITIVE FILM COPIES FROM GLASS PLATES
Mark M. Hanna *In* Royal Observatory Astron. Phot. 1984 1984 p 153-155 (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A light metering technique which is reliable enough to allow six or more interpositive astronomical film copies from different plates to be exposed and batch processed is described. Set up the enlarger to the correct magnification. Meter the light at the easel by placing the light sensitive window of the meter in the sky background portion of the image on the easel, avoiding bright stars and the corners. Hold the meter in the on position for 15 to 20 sec and adjust the lens aperture and voltage (or both) to get a meter reading of 5.2. Expose 10 sec on Kodak Gravure Positive film. Process the film to a Gamma of 0.80. Aim for a D-max of 1.15 to 1.30 in the sky portion of the interpositive. Author (ESA)

N85-16119# Kitt Peak National Observatory, Tucson, Ariz.
UNSHARP MASKING AT THE ENLARGER
Mark M. Hanna *In* Royal Observatory Astron. Phot. 1984 1984 p 157-163 Sporored by NSF (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

An unsharp masking technique used on enlarged astronomical images is described. Easel preparation, mask making, making of the corrected interpositive, and multiple exposure techniques are

outlined. Exposure and processing steps have more latitude compared to traditional methods, while registration is accomplished with simple tools. Added flexibility in terms of contrast control when making the corrected interpositive is achieved. Author (ESA)

N85-16120# Sofia Univ. (Bulgaria). Dept. of Astronomy.
PROCESSING OF PHOTOGRAPHIC OBSERVING MATERIAL AT THE NATIONAL ASTRONOMICAL OBSERVATORY ROZHEN
B. Zh. Kovachev, M. K. Tsvetkov, and V. I. Tsintsarov *In* Royal Observatory Astron. Phot. 1984 1984 p 165-171 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The photochemical processing and hypersensitization of plates from optical telescopes is summarized. Processing equipment and the PDP 11/34 system used for processing photographic data are described. Author (ESA)

N85-16121# Royal Observatory, Edinburgh (Scotland).
THE UK SCHMIDT TELESCOPE AND THE FACILITIES IN EDINBURGH
R. D. Cannon *In its* Astron. Phot. 1984 1984 p 173-176 ref (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A library of 4500 photographic plates of objects observed by the UK Schmidt telescope is described. The 1.2 m telescope was designed for a very deep photographic survey of the southern sky. The library stores the original plates and makes copies. Originals of nonsurvey or survey rejects can be borrowed for long term measuring, but the library also has measuring facilities. Author (ESA)

N85-16122# Royal Observatory, Edinburgh (Scotland).
THE WORK OF THE PHOTOLABS AT THE ROYAL OBSERVATORY, EDINBURGH
B. W. Hadley *In its* Astron. Phot. 1984 1984 p 177-184 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The technical and organizational aspects of an astronomical photography laboratory are outlined. One section is entirely concerned with direct UK Schmidt telescope plate contact copying on glass and film. The other section is devoted to all other photography in support of astronomy and its publicity, together with more conventional areas of work, such as neg/pos color and monochrome printing, studio work, flat copy copying, photomacrography, slide manufacture, and hand processing of 35 mm, 120, 5 x 4 in and larger films. Photofinishing and process control of color equipment are carried out in an attached office where hand cameras and equipment are also stored. Projects include a near infrared film atlas, and equatorial J survey, a reference manual of objective prism spectra, and selenium toning of Schmidt telescope plates. Author (ESA)

N85-16123# Edinburgh Univ. (Scotland).
AN INVESTIGATION INTO THE FIDELITY OF REPRODUCTION OF UKST ORIGINAL OBJECTIVE PRISM PLATES ON TO FILM
M. T. Brueck and J. D. Waldron (Royal Observatory, Edinburgh) *In* Royal Observatory Astron. Phot. 1984 1984 p 185-190 ref (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The range of photographic density, spectral resolution, and suitability for photometry of films made from Schmidt telescope plates was assessed. A combination of intermediate positive and copy negative which gives the optimum reproduction of original objective prism plates is found. It is shown that while loss of density at the bright end, corresponding to 0.6 magnitude, cannot be avoided, the copied spectra below the limiting density level can be used for spectral classification and for photometry over a range of 3 or 4 magnitudes. For the identification of objects with unusual spectra such as emission line stars or quasars, where photometry is not essential, the curtailment of the effective density range is less severe. Author (ESA)

N85-16124# Tokyo Astronomical Observatory (Japan).
EXTENDING MAGNITUDE STANDARDS TO FAINT STARS WITH A SUB-BEAM PRISM c74
Keiichi Ishida *In* Royal Observatory Astron. Phot. 1984 1984 p 197-202 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A sub-beam prism method to extrapolate a magnitude scale to faint stars on photographic plates taken with a Schmidt telescope was developed. A magnitude scale can be extrapolated by 4.5 mag with an accuracy within 0.1 mag. Magnitude difference between primary and secondary images giving identical magnitude parameters is approximated by a linear function of magnitude, in which two numerical constants are chosen for each individual plate. The design of the sub-beam prism and the derivation procedure of the constants are presented. Author (ESA)

N85-16125# Tokyo Astronomical Observatory (Japan).
SUB-BEAM PRISM USED AT THE BOSSCHA SCHMIDT TELESCOPE c74
Takeshi Noguchi, Moedji Raharto (Bosscha Observatory), and Bambang Hidayat (Bosscha Observatory) *In* Royal Observatory Astron. Phot. 1984 1984 p 203-205 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A Schmidt telescope sub-beam prism was tested using five blue and three visual plates. In the B and V-bands the extent of the diffraction pattern amounts to 1.56 and 2.03 arcsec respectively. These values are in the order of the average seeing at the observatory. The contribution from the chromatic aberration effect is negligibly small, 0.48 and 0.37 arcsec in B and V respectively. The slope of the regression line in the 7 magnitude range is small. Therefore the magnitude difference between primary and secondary images is independent of magnitude. Averaging the magnitude differences gives a value of 4.2. In view of the ratio of the prism to corrector diameters, the result is encouraging. Author (ESA)

N85-16126# Durham Univ. (England). Dept. of Physics.
ASTRONOMERS' PROBLEMS WITH THE CALIBRATION OF SCHMIDT PLATES
R. Fong, J. G. Godwin (Oxford Univ.), and N. Metcalfe *In* Royal Observatory Astron. Phot. 1984 1984 p 207-217 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Comparison of photographic aperture magnitudes from the PDS measurement of a sky-limited UK Schmidt plate J3721 with calibrated magnitudes for the stars in Hawkins' SGPG2 sequence revealed that the photographic magnitudes for faint stars are too bright. This discrepancy persists when the magnitudes are compared with similar results from the PDS measurement of a sky-limited AAT plate of the same area. Stars fainter than B20 are consistently estimated brighter when using the Schmidt plate than when using the AAT plate, giving a relative scale error of 0.1 mag/mag. It is not known if the problem is intrinsic to Schmidt plates. Author (ESA)

N85-16127# Royal Observatory, Edinburgh (Scotland).
POWER SPECTRUM ANALYSIS OF ASTRONOMICAL PHOTOGRAPHS DIGITISED WITH SMALL APERTURES
R. S. Stobie, S. Okamura, A. C. Davenhall, and H. T. MacGillivray *In its* Astron. Phot. 1984 1984 p 219-236 refs Sponsored by British Council (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Noise characteristics of images on 8 UK Schmidt Telescope plates, 2 Anglo-Australian Telescope prime focus plates, and 2 Palomar Observatory Sky Survey (POSS) copies (comprising 3 different emulsion types) were measured with a scanning aperture of 11 microns and a pixel spacing of 16 microns. Power spectrum analysis shows plate noise (except POSS plates) to correspond to almost white noise over the frequency range 0.1 to 60 cycles/mm. The signal-to-noise power spectrum is shown to be a useful tool for measuring the information content of an astronomical photograph. Macronoise computed over 8 x 8 mm

regions on the plates varies as the minus half power of the aperture area. Information content of a survey quality IIIa-J plate and atlas quality copies on very fine-grained emulsion were compared. Analysis shows no significant degradation in emulsion noise or image content of the copy relative to the original.
Author (ESA)

N85-16128# Royal Observatory, Edinburgh (Scotland).
RECENT DEVELOPMENTS ON THE COSMOS PLATE-SCANNING MACHINE
H. T. MacGillivray *In its* Astron. Phot. 1984 1984 p 237-244 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

Modifications to a computer controlled high speed microdensitometer which can scan 267 x 287 mm astronomical photographic plates in < 4 hr are described. The level of production on the machine, major projects being carried out, research highlights and developments to enhance the performance are outlined. It is used in studies of galactic structure, detection of variable objects, large scale distribution of galaxies, and detection of quasars.
Author (ESA)

N85-16129# Muenster Univ. (West Germany). Dept. of Astronomy.
PLATE MEASUREMENTS AND REDUCTIONS AT MUENSTER
D. Teuber, H.-J. Tucholke, C. C. Volkmer, R. Budell, R. Duemmler, H. Horstmann, H.-G. Scheuer, and W. C. Seitter *In* Royal Observatory Astron. Phot. 1984 1984 p 245-252 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A microdensitometer used with astronomical photography plates is described. Positional error derived from repeated measurements of a sharp edge is of the order of 0.1 microns with only small increases for scan speeds near the beginning and the end of the full scale from 0 to 226 mm/sec. Positional measurements of stars using Gauss fits to marginal distributions yield differences of 0.6 microns for different plate orientations. Differences with respect to catalog positions, using quadratic reduction models, yield a mean of 1.2 microns for well-exposed IIa-O plates with plate scales of 40 sec/mm and reference stars from the AGK3 corresponding to 0.05 sec for single measurements. Photometric accuracy for a typical multiplier voltage is 0.25% in density 3, 0.29% in transmission 1. Author (ESA)

N85-16130# Nicolaus Copernicus Univ., Torun (Poland). Inst. of Astronomy.
THE TORUN MEASURING SYSTEM FOR ASTRONOMICAL SPECTRA
S. Krawczyk, Z. Turlo, B. Wikierski, and A. Woszczyk *In* Royal Observatory Astron. Phot. 1984 1984 p 253-260 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A system for processing recorded astronomical spectra is described. It consists of a modernized Zeiss Rapid GII microphotometer with the ancillary equipment and, incorporated into this system, an on-line MERA 305 minicomputer with its peripheral devices. The minicomputer has 8K bytes core memory and 8 bit words. In the photodetector head, the selenium photovoltaic cell was replaced by a photodetector subassembly containing three independent silicon cells, allowing three channel operation. Programs for real time recording and spectrum processing, and for reducing spectra to the continuum level were written.
Author (ESA)

N85-16131# Nijmegen Univ. (Netherlands). Inst. of Astronomy.
THE MALIN EFFECT IN STELLAR PHOTOGRAPHY
Theo Wesselink *In* Royal Observatory Astron. Phot. 1984 1984 p 261-267 refs Sponsored by Netherlands Organization for Astronomical Research (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The Malin effect on stellar photometry was examined on filtered and hypersensitized IIIaJ and IIIaF plates exposed at the United Kingdom Schmidt Telescope. Comparison with plates exposed in a stream of dry nitrogen shows that the Malin effect causes a change in stellar response as function of the position on the plate. Stellar response is defined as the density integral of the stellar image above sky. The gradient increases towards the plate edge and is circularly symmetric. The effect on stellar response at the plate edges caused by these gradients range from +025m (decrease), to -0.10m (increase). The mean change at the plate edges is +0.07m. The gradients in stellar response can be described in terms of sensitivity variations combined with changes in reciprocity failure. For filtered and hypersensitized plates exposed in dry nitrogen, a flat photometric system with an accuracy of 0.02m can be defined. Author (ESA)

N85-16132# Sofia Univ. (Bulgaria). Dept. of Astronomy.
SOME APPLICATIONS OF SIGNAL-TO-NOISE IN PHOTOGRAPHIC STELLAR PHOTOMETRY
V. K. Golev, G. R. Ivanov, and N. S. Nikolov *In* Royal Observatory Astron. Phot. 1984 1984 p 269-277 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

The concept of output signal-to-noise is used to determine the limiting stellar magnitude, the signal-to-noise of stellar images, and the precision of the photometry of faint stars on a given plate taken by a 2-m telescope. Tests of the results show their reasonableness and underline the usefulness of the output signal-to-noise concept in astronomical photography. Author (ESA)

N85-16133# Bonn Univ. (West Germany). Sternwarte.
STELLAR PHOTOGRAPHIC PHOTOMETRY USING A DOUBLE WEDGE TECHNIQUE WITH A FOCAL REDUCER SYSTEM
Edward H. Geyer *In* Royal Observatory Astron. Phot. 1984 1984 p 279-284 refs (For primary document see N85-16102 07-35)
(Contract DFG-Ge-209/10)
Avail: NTIS HC A15/MF A01

The photometric autocalibration of astronomical plates with a half filter biprism arrangement (heliometer principle) was tested with the focal reducer system of a 106 cm Cassegrain reflector. Photographic stellar magnitude scales free of systematic errors can be obtained by this method in an range of at least 7 m.
Author (ESA)

N85-16134# Basel Univ. (Switzerland). Inst. of Astronomy.
SPECTROPHOTOMETRY OF COOL STARS FROM OBJECTIVE PRISM SPECTRA
Lukas Labhardt *In* Royal Observatory Astron. Phot. 1984 1984 p 285-293 refs Sponsored by Swiss National Science Foundation (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A technique for obtaining low dispersion spectrophotometry of cool stars from objective prism plates is presented. Photographic stellar spectra are calibrated by a spot sensitometer and combined with published photoelectric scans. The resulting spectrophotometry covers an extended spectral region with a wavelength spacing increasing from 1.5 A in the blue to 27 A in the near infrared. Author (ESA)

N85-16135# Hamburger Sternwarte (West Germany).
FIRST TESTS ON THE ASTROMETRIC PERFORMANCE OF THE NEW PDS1010G AT HAMBURG OBSERVATORY
Chr. deVegt and Th. Kleine *In* Royal Observatory Astron. Phot. 1984 1984 p 295-300 refs (For primary document see N85-16102 07-35)
(Grant DFG-Ve-37/13)
Avail: NTIS HC A15/MF A01

Repeatability tests were performed on a PDS1010G microdensitometer. From these measurements, extended up to 11 hr, significant drift of coordinates reaching several microns and occasional discrete 1 micron glitches are found in accordance with similar results from other PDS granite systems. With the present system configuration therefore precise astrometric measurements cannot be performed without substantial instrumental modifications. Author (ESA)

N85-16136*# Virginia Univ., Charlottesville. Dept. of Astronomy.
ASTROMETRIC APPLICATIONS OF THE MT. STROMLO PDS 1010A **c89**
Philip A. Ianna *In* Royal Observatory Astron. Phot. 1984 1984 p 301-310 refs (For primary document see N85-16102 07-35)
(Contract JPL-956230; Grant NSF AST-82-00232)
Avail: NTIS HC A15/MF A01 CSCL 14B

Problems in photographic astrometry to which the Mt. Stromlo (VA) microdensitometer is applied are described. It is used for measuring southern parallax region plates to determine photographic positions of the brighter satellites of the outer plantes. Tests of the overall astrometric accuracy and stability of the machine, as well as results, show micron-level pecularities, but overall a quite satisfactory level of performance for the system.
Author (ESA)

N85-16137# Sterrewacht, Leiden (Netherlands).
AUTOMATED STAR COUNTS IN NEBULOUS AREAS **c89**
C. P. deVries *In* Royal Observatory Astron. Phot. 1984 1984 p 311-319 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

A star counting program which uses offline data from the Astroscan measuring machine was developed. Since homogeneous, large files of photographic material of most of the sky already exists in the form of the Palomar/SERC/ESO surveys it was decided to tune the parameters of the program to these (survey) Schmidt plates. For counts in nebulous areas it is important to make high resolution maps of the underlying background structures. Correlation of these, multicolor background maps and the stellar density maps can separate different physical structures in complicated areas. The properties of interstellar dust seem to explain the observed correlation between the interstellar extinction and surface brightness in most of the area investigated.
Author (ESA)

N85-16138# Pennsylvania State Univ., University Park. Dept. of Electrical Engineering.
WHITE-LIGHT OPTICAL INFORMATION PROCESSING AND HOLOGRAPHY Annual Report, 15 Mar. 1983 - 14 Mar. 1984
F. T. S. Yu 22 Jun. 1984 64 p
(Grant AF-AFOSR-0140-83)
(AD-A146938; AFOSR-84-0889TR) Avail: NTIS HC A04/MF A01 CSCL 14/5

Progress has been made on the white-light optical information processing and holography research program. Work was completed on a broad band color image deblurring and this technique was extended to the restoration of 2-D out-of-focused color photographic images. A new technique of white-light density pseudocolor encoder was developed for three primary colors. This white-light pseudocolor encoder is very cost effective and offers a high image resolution, which would be an excellent alternation for the digital counterpart. We have also in this period conducted a measuring technique for the degree of coherence in the Fourier plane of the grating-based white-light signal processor. We have shown that high degree of coherence is achievable with a signal sampling grating at the input plane. Thus the white-light technique is capable of processing the information in complex amplitude and it is very suitable for color signal processing. In this phase of research we have also studied the effect of coherence due to source encoding, signal sampling and spectral band filtering, as applied to the white-light signal processing. GRA

N85-16139# Air Force Weapons Lab., Kirtland AFB, N. Mex.
INFRARED PRESENSITIZATION PHOTOGRAPHY Final Report, Jun. 1983 - Jun. 1984
J. M. Geary Sep. 1984 42 p
(AD-A146968; AFWL-TR-84-92) Avail: NTIS HC A09/MF A01 CSCL 14/5

Infrared presensitization photography (IRPP) is a double exposure technique that allows the recording of IR information on standard silver halide films not ordinarily sensitive in this long wavelength regime. This dissertation prescribes conditions for the practical implementation of the IRPP process in data collection. It then moves on to an investigation of mechanism; i.e., why does IRPP work? The study is divided into experimental and theoretical portions, with much heavier emphasis on the former. Experiments delve into the behavior of the characteristic and spectral sensitizing curves of film within the context of the IRPP phenomenon. The temperature rise experienced by the film during this process is determined. The influence of sensitizing dyes and ionic population increases in the grain crystals is also explored. Theoretical efforts concentrate on an extension of the shaw photographic model to explain the IRPP effect in terms of a downshifting in the overall quantum sensivitity requirements of the grain population.
Author (GRA)

N85-16140# Army Combat Systems Test Activity (Provisional), Aberdeen Proving Ground, Md.
ILIR TASK OF DIGITAL RECOIL TRAVEL MEASUREMENT SYSTEM Final Report, Oct. 1982 - Jul. 1984
V. A. Betzold and C. L. Francis Jul. 1984 61 p
(DA Proj. 1L1-61101-A-91-A)
(AD-A147102; USACSTA-6045) Avail: NTIS HC A04/MF A01 CSCL 14/2

A study was conducted to improve measurement of large caliber weapon recoil travel. Since the 1950s, a continuous rotation, single turn potentiometer driven by a rack and pinion gear has been used on a variety of weapons. Satisfactory data has been produced by this system, but the data records suffer from a number of problems caused by the potentiometer. Therefore, the potentiometer was replaced by a digital incremental optical shaft encoder. Circuitry was developed to interface the encoder output to a digital data acquisition system. Software was then written to process the data at the firing site, and provide a near real-time plot of recoil travel and velocity versus time. Originator supplied keywords include: Ballistic Test Site Terminal, and Incremental Optical Encoder. GRA

N85-16141# Department of the Navy, Washington, D. C.
A BIOLOGICAL SENSOR FOR THE DETECTION OF TOXICANTS Patent Application
A. V. Stiffey, N. L. Jarvis, and H. Wohltjen, inventors (to Navy) Filed 1 Oct. 1984 21 p
(AD-D011304; US-Patent-Appl-SN-656208) Avail: NTIS HC A02/MF A01 CSCL 06/13

A method and an apparatus are described for rapidly detecting toxicants via the use of a first carbon dioxide sensing cell and a second reference carbon dioxide sensing cell, with each sensing cell including a first chamber and a second chamber, separated by a carbon dioxide permeable membrane, and a pH sensor disposed in each of the second chambers. The method includes the step of placing distilled water in the first chamber of each cell, and allowing its dissolved carbon dioxide to become equilibrated with the water in the second chamber, from which it is separated by the carbon dioxide permeable membrane. Next, exact amounts of a microorganism and sugar are added to small dishes in the first chambers along with control vegetation for one dish and vegetation to be tested to the other dish. Then the first chambers are completely filled with distilled water and the dishes are agitated to facilitate a solution of microorganisms and sugar.
GRA

N85-16142# Department of the Air Force, Washington, D.C.
DYNAMIC POLYMER PRESSURE TRANSDUCER WITH TEMPERATURE COMPENSATION Patent Application
A. J. Bur, inventor (to Air Force) Filed 6 Sep. 1984 16 p
(AD-D011373; US-Patent-Appl-SN-647782) Avail: NTIS HC A02/MF A01 CSCL 14/2

Accurate dynamic pressure data in a changing thermal environment is obtained through the use of a pressure gage formed from polyvinylidene fluoride (PVDF) polymer material. The temperature compensation pressure gage has three major elements: an active PVDF transducer which obtains remote pressure readings which are uncorrected for thermal effects; a thermocouple having a short rise time allowing an output thermal signal which dynamically

responds to changing thermal conditions; and a compensation amplifier circuit receiving the uncorrected pressure readings and the dynamic thermal signal and producing an output signal representing accurate pressure data which is corrected for changing thermal conditions. Also disclosed are the details of making an active PVDF transducer. GRA

N85-16143# Eidgenoessisches Flugzeugwerk, Emmen (Switzerland).
SIX-COMPONENT STRAIN GAGE BLOCK SCALE 167-6B. PART 1: CALIBRATION, SEPTEMBER 1983 [6-KOMPONENTEN-DMS-BLOCKWAAGE 167-6B. 1. EICHUNG/SEPTEMBER 1983]
Caesar Wyss 17 Nov. 1983 75 p refs In GERMAN
(F+W-FO-1699) Avail: NTIS HC A04/MF A01

The calibration of a six-component strain gage block balance for measurements in wind tunnels is described. The temperature dependance is considered. An error estimation is given. Calibration measurements are presented. Author (ESA)

N85-16144# Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H., Vienna. Inst. fuer Isotopenanwendung.
METHOD FOR NON CONTACTING GAUGING OF THE WALL THICKNESS OF TUBES BY BACKSCATTERING RADIATION
Erich Frevert Mar. 1984 34 p refs In GERMAN; ENGLISH summary
(OEFZS-4274; IA-128/84) Avail: NTIS HC A03/MF A01

A noncontact method for rapid precise estimation of the wall thickness of steel tubes, using backscattering of 137 Cs gamma rays was developed. Construction of the measuring head is described. By fitting the measured backscattering values to defined curves a mathematical expression for the influences of the opposite tube wall and the tube diameter is found. By making two measurements on exactly opposite sites, every pair of values can be assigned to the corresponding wall thickness if the diameter is known. By gaging at 4 positions each staggered at 90 deg, maximum and minimum thickness can be calculated. Author (ESA)

N85-16145# Research Inst. of National Defence, Linkoeping (Sweden). Dept. 3.
DATA HANDLING FOR THE SPECTRAL RADIOMETER (SPERAD)
Bruno Engstroem Aug. 1984 35 p refs
(FOA-C-30368-E1,E4; ISSN-0347-3708) Avail: NTIS HC A03/MF A01; Research Institute for National Defence, Stockholm KR 50

Data handling of a radiometer for measuring radiant intensity in the infrared region of the spectrum is described. Data are stored on an instrumentation tape recorder, digitally in serial form. Large data volumes are generated. The method used to convert starting mode data to computer tape, which can be read by DEC-10 computer is outlined. A small laboratory computer, the Data-board 4680, is used for the conversion, and during the process a lot of redundant information is removed from the flow of data. The first steps of handling radiometer-data on the DEC-10 computer are also described. Author (ESA)

N85-16146# Dayton Univ., Ohio. Environmental Sciences Group.
DESCRIPTION AND OPERATION OF A THERMAL DECOMPOSITION UNIT-GAS CHROMATOGRAPHIC SYSTEM
Wayne A. Rubey, Ira B. Fiscus, and Juan L. Torres Sep. 1984 154 p refs Sponsored by EPA
(PB84-246362; EPA/600-2-84-149) Avail: NTIS HC A08/MF A01 CSCL 14B

Before acceptable incineration procedures can be fully developed for hazardous organic materials, precise information is often needed concerning their thermal decomposition properties. In response to this need, a laboratory scale thermal decomposition unit gas chromatographic system (TDU-GC) has been designed and assembled to provide data rapidly and safely on the gas phase thermal decomposition behavior of organic substances. This system has been designed to accommodate a wide variety of organic materials which range from pure substances to very complex industrial organic waste mixtures. This report describes the design and operation of the TDAS (Thermal decomposition analytic systems). Author (GRA)

N85-16147# National Bureau of Standards, Boulder, Colo. Electromagnetic Fields Div.
NBS (NATIONAL BUREAU OF STANDARDS) SWITCHING RADIOMETERS Final Report
C. K. S. Miller and W. C. Daywitt May 1984 24 p refs
(PB84-235894; NBSIR-84/3004) Avail: NTIS HC A02/MF A01 CSCL 14B

An error analysis for the Dicke radiometers used by the National Bureau of Standards (NBS) in their WR90 waveguide noise calibration services for sources with noise temperatures above 1000 kelvin is discussed. A list of measurement frequencies currently available in the WR90 and WR62 bands is presented. Author (GRA)

N85-16148# National Bureau of Standards, Washington, D.C. Building Equipment Div.
NATIONAL BUREAU OF STANDARDS PASSIVE SOLAR TEST FACILITY: INSTRUMENTATION AND SITE HANDBOOK
B. M. Mahajan Aug. 1984 89 p refs Sponsored in part by DOE
(PB85-100451/GAR; NBSIR-84/2911) Avail: NTIS HC A05/MF A01 CSCL 14B

This handbook provides a complete description of the test building, thermophysical properties of the building material, location of the sensors installed at the test facility, and data acquisition system and procedures. GRA

N85-16149# United Kingdom Atomic Energy Authority, Harwell (England). Instrumentation and Applied Physics Div.
A NARROW BAND PULSED EDDY CURRENT INSTRUMENT FOR MATERIALS TESTING
K. D. Boness, C. C. Holt, and R. P. Holt Jul. 1984 23 p refs
(AERE-R-11229) Avail: NTIS HC A02/MF A01

The principles of operation of an experimental prototype instrument known as J-SCAN are described along with the derivation of formulae for the rapid calculation of normalized impedances; the structure of the instrument; relevant probe design parameters; digital quantization errors; and approaches for the optimization of single frequency operation. An eddy current probe is used As the inductance element of a passive tuned-circuit which is repeatedly excited with short impulses. Each impulse excites an oscillation which is subject to decay dependent upon the values of the tuned-circuit components: resistance, inductance and capacitance. Changing conditions under the probe that affect the resistance and inductance of this circuit will thus be detected through changes in the transient response. These changes in transient response, oscillation frequency and rate of decay, are digitized, and then normalized values for probe resistance and inductance changes are calculated immediately in a micro processor. This approach coupled with a minimum analogue processing and maximum of digital processing has advantages compared with the conventional approaches to eddy current instruments. In particular there are: the absence of an out of balance condition and the flexibility and stability of digital data processing. M.G.

N85-15682# Aeritalia S.p.A., Torino (Italy). Gruppo Velivoli da Combattimento.
FLIGHT PARAMETERS RECORDING FOR STRUCTURE FATIGUE LIFE MONITORING
F. Staropoli *In* AGARD Operational Loads Data Aug. 1984 7 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15683# Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Force Management Group.
USAF APPROACH TO AIRBORNE STRUCTURAL DATA RECORDING: AIRBORNE DATA ACQUISITION MULTIFUNCTION SYSTEM (ADAMS)
Ray J. Veldman *In* AGARD Operational Loads Data Aug. 1984

3 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-16049# Joint Publications Research Service, Arlington, Va.
DIGITAL THERMOMETER WITH LINEARIZER ON SLIDE WIRE Abstract Only
I. A. Belousov, A. A. Sachenko, and V. V. Kochan *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 54 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Prioborostr. (Leningrad), v. 27, no. 6, Jun. 1984 p 82-86 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16050# Joint Publications Research Service, Arlington, Va.
ENSURING REQUIRED METROLOGICAL RELIABILITY OF ANALOG INSTRUMENT CHANNELS BY PARAMETRIC COMPENSATION Abstract Only
R. V. Dolidze and I. V. Mostovoy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 55 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Priborostr. (Leningrad), v. 27, no. 6, Jun. 1984 p 87-91 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16717# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
THE WIDE-RANGE SPACE RADIO INTERFEROMETER
V. V. Andrejanov, L. I. Gurvits, N. S. Kardashev, S. V. Pogrebenko, V. A. Rudakov, R. Z. Sagdeev, and G. S. Tsarevsky *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 161-164 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

36 LASERS AND MASERS

Includes parametric amplifiers.

N85-16150 United Kingdom Atomic Energy Authority, Culham (England).
SILENT DISCHARGE CARBON DIOXIDE GAS LASER MACHINING FACILITY
N. Tabata, S. Yagi, I. Mori, Y. Kimbata, and E. Hayashi 28 Jun. 1984 22 p refs Transl. into ENGLISH from Mithsubishi Denki Giho (Japan), v. 56, no. 5, 1982
(BLL-CTO-2267-(9091.9F)) Copyright. Avail: British Library Lending Div., Boston Spa, England

The characteristics of a silent discharge (SD) carbon dioxide laser are summarized as follows: (1) fast response; (2) high-frequency pulsed lasing; (3) high efficiency; (4) long-life electrodes; (5) nitrogen-rich laser gas; (6) long-term sealed-gas operation; and (7) stable output power. The research and development, commercial production, and machining characteristics of a SD carbon dioxide laser machining facility were reported. Although a 1 kW laser of this type (ml-1000p) was produced, it is predicted that the output power and performance maybe improved by utilizing the excellent characteristics, such as the high efficiency and high-frequency pulsed lasing properties. B.G.

N85-16151 Department of the Navy, Washington, D. C.
PASSIVE MASER USING TIMESHARING FOR CONTROL OF THE CAVITY AND CONTROL OF THE OSCILLATOR ON THE LINE OF STIMULATED EMISSION Patent
A. H. Frank and J. D. White, inventors (to Navy) Issued 15 May 1984 12 p Supersedes AD-D008631
(AD-D011326; US-Patent-4,449,105; US-Patent-Appl-SN-265129; US-Patent-Class-331-3) Avail: US Patent and Trademark Office CSCL 20/5

A passive maser is described wherein control of the cavity and control of the oscillator on the line of stimulated emission operate in a shared-time mode. A control circuit acts on the injected signal by way of a programmable synthesizer, the injected signal then assuming the successive values omega L+, omega H, omega H and omega c+, omega H and omega c-, omega L-, omega L+, etc. in stages. Omega H is centered on the line of stimulated emission omega L+ and omega L- which are symmetrically shifted interrogate the sides of the emission line; and omega C+ and omega C- which are further symmetrically shifted interrogate the sides of the cavity resonance. The control circuit periodically inhibits the detection action used for controlling the oscillator, and the detection action used for controlling the cavity is carried out only during the inhibition period. Author (GRA)

N85-16152 Department of the Navy, Washington, D. C.
EXTERNAL CAVITY DIODE LASER SENSOR Patent
R. O. Miles, T. G. Giallorenzi, and A. B. Tveten, inventors (to Navy) Issued 5 Jun. 1984 8 p Supersedes AD-D008729
(AD-D011341; US-Patent-4,452,533; US-Patent-Appl-SN-286099; US-Patent-Class-356-352) Avail: US Patent and Trademark Office CSCL 20/5

This document describes a sensor for sensing conditions such as acoustic waves, temperature changes, acceleration current and magnetic fields. The sensor employs a diode laser having its cavity contained between end facets defined by partially reflective mirrors, supplemented by an external cavity formed between one of the end facets of the laser and a translatable external reflector. The reflector is position-responsiveness to a condition to be sensed. A change in the reflector's positions causes laser output light to be fed back through the mirror into the laser cavity with varying phase such that an increase or decrease in laser emission is created. A change of detector voltage or change in laser current provides an indication of environmental condition being sensed. Author (GRA)

N85-16153 Department of the Air Force, Washington, D.C.
METHOD OF PRODUCING A BURIED LONG PERIOD GRATING Patent
R. H. Pohle and R. C. Ohlmann, inventors (to Air Force) Issued 9 Oct. 1984 6 p Supersedes AD-D010539
(AD-D011351; US-Patent-4,476,161; US-Patent-Appl-SN-518590; US-Patent-Class-427-162) Avail: US Patent and Trademark Office CSCL 20/5

A method of producing a buried long period grating which is substantially unaffected by material stability, high tolerance requirements, stringent machining requirements, and heat transfer is discussed. The method takes a plurality of rectangular-shaped pieces of dielectric material and by a series of appropriate cuts, coatings and attachments produces an effective buried long period grating. GRA

N85-16154 Department of the Air Force, Washington, D.C.
RIPPLED-FIELD MAGNETRON APPARATUS Patent
G. Bekefi, inventor (to Air Force) Issued 14 Aug. 1984 5 p Supersedes AD-D009826
(AD-D011354; US-Patent-4,465,953; US-Patent-Appl-SN-418867; US-Patent-Class-315-39.71) Avail: US Patent and Trademark Office CSCL 20/5

The ripple-field magnetron is a novel cross-field millimeter wave source in which electrons move under the combined action of a radial electric field, an axial magnetic field and an azimuthally periodic wiggler magnetic field, B(w) cos (N x Theta) oriented transversely to the flow. Estimates are given of the frequency and growth rate of the free electron laser (FEL) type of instability excited in this smooth-bore magnetron configuration.Author (GRA)

N85-16155 Department of the Air Force, Washington, D.C.
RF LASER ARRAY DRIVER APPARATUS Patent
C. R. Chubb and V. H. Nettle, Jr., inventors (to Air Force) Issued 18 Sep. 1984 4 p Supersedes AD-D008954
(AD-D011375; US-Patent-4,472,807; US-Patent-Appl-SN-289660; US-Patent-Class-372-38) Avail: US Patent and Trademark Office CSCL 20/5

An RF laser array driver apparatus with a dc bias input and and RF input to modulate a diode array and provide a modulated optical output is described. The driver circuit comprises a series impedance which is in parallel with the diode array to provide a

50 ohm impedance to the RF input signal that is substantially constant with frequency. Author (GRA)

N85-16156 Department of the Air Force, Washington, D.C.
TURBULENCE MEASUREMENT INTERFEROMETER APPARATUS Patent
J. M. Geary, inventor (to Air Force) Issued 14 Aug. 1984 6 p Supersedes AD-D009885
(AD-D011377; US-Patent-4,465,372; US-Patent-Appl-SN-422429; US-Patent-Class-356-359) Avail: US Patent and Trademark Office CSCL 20/5

Turbulence measurement interferometer apparatus includes a station having an entrance pupil and an aerodynamically stable boom connected to the station. The station houses an optical mirror arrangement defining an optical axis which extends through the entrance pupil. The boom has an end point spaced from the station but disposed on the optical axis. A laser generates a low power beam which is split into first and second portions. The first portion is guided to the boom end point and launched therefrom as a spherical wavefront through turbulence in front of the entrance pupil and toward the mirror arrangement, which in turn transforms it into an object collimated wavefront. The second portion of the beam is transformed into a second collimated reference wavefront which is combined with the first collimated wavefront and produces an interference pattern which is recorded on a medium, such as a photographic plate. The interference pattern provides information on the turbulence structure present at the entrance pupil of the station. GRA

N85-16157 Department of the Air Force, Washington, D.C.
DIFFUSION BARRIER FOR LONG WAVELENGTH LASER DIODES Patent
F. Z. Hawryło, inventor (to Air Force) Issued 23 Oct. 1984 5 p Supersedes AD-D009558
(AD-D011390; US-Patent-4,479,222; US-Patent-Appl-SN-372364; US-Patent-Class-374-45) Avail: US Patent and Trademark Office CSCL 20/5

A diffusion barrier is created in a n-type heterojunction layer adjacent to the active region of a semiconductor laser by doping the n-type layer with a periodic table group VI element. The diffusion barrier in the n-type layer prevents the migration of acceptors into that layer. The group VI elements are, in particular, sulfur (S), selinium (Se), and tellurium (Te). The acceptor of concern is zinc (Zn). Author (GRA)

N85-16158 Department of the Air Force, Washington, D.C.
DELTA WING NOZZLE ASSEMBLY FOR CHEMICAL LASERS Patent
J. E. Broadwell, inventor (to Air Force) Issued 14 Aug. 1984 6 p Supersedes AD-D009502
(AD-D011396; US-Patent-4,466,100; US-Patent-Appl-SN-382324; US-Patent-Class-372-89) Avail: US Patent and Trademark Office CSCL 20/5

This abstract discloses a delta wing nozzle assembly for use within a supersonic chemical laser having a plurality of delta wing-shaped elements which substantially increases the mixing rate of the active reactive gaseous ingredients injected into the resonant cavity of the laser. Each of the plurality of delta wing-shaped elements being of a triangular configuration in which the shape thereof is such that the flow of the gaseous ingredients thereover, normal to the leading edge of the triangular-shaped element, is subsonic. This increased mixing rate substantially increases the output power of the laser. GRA

N85-16159*# Hughes Aircraft Co., Los Angeles, Calif. Electro-Optical and Data Systems Group.
SPACECRAFT SYSTEM STUDY: A STUDY TO DEFINE THE IMPACT OF LASER COMMUNICATION SYSTEMS ON THEIR HOST SPACECRAFT Final Report
Apr. 1984 261 p refs
(Contract NAS5-27139)
(NASA-CR-175272; NAS 1.26:175272; FR84-75-717) Avail: NTIS HC A12/MF A01 CSCL 20E

The mutual influence of a laser communication system and its host spacecraft and the degree to which the mutual influence limited acquisition, tracking and pointing processes were investigated. A laser klink between a low earth orbiting (LEO) satellite and a geosynchronous earth orbiting (GEO) satellite was used as a baseline. The laser link between satellites was a generic channel transferring 500 Mbps data from the LEO to GEO using the GaAlAs laser as the laser light source. Major aspects of pointing and tracking with a satelliteborne optical system were evaluated including: (1) orbital aspects such as spacecraft relative motions, point ahead, and Sun snd Moon optical noise; (2) burst errors introduced by the electronic and optical noise levels; (3) servo system design and configurations, and the noise sources such as, sensor noise, base motion disturbances, gimbal friction torque noise; (4) an evaluation of the tracking and beacon link and the type of sensors used; (5) the function of the acquisition procedure and an evaluation of the sensors employed; and (6) an estimate of the size, weight and power needed for the satellite system. M.G.

N85-16160# University of Southern California, Los Angeles. Center for Laser Studies.
UPGRADING FLEXIBLE INFRARED WAVEGUIDES Final Report, Apr. 1982 - Nov. 1983
E. Garmire Kirtland AFB, N. Mex. AFWL Aug. 1984 73 p
(Contract F29601-82-C-0059)
(AD-A146763; AFWL-TR-84-14) Avail: NTIS HC A04/MF A01 CSCL 20/6

This study shows that the critical factor in the performance of flexible infrared waveguides is in the mode quality of the input beam and the alignment of the waveguide rather than in the fabricational tolerances. More than 98% transmission has been demonstrated through a 1-m waveguide. Also investigated was the possible extension of these waveguides to shorter wavelengths, demonstrating diffraction limited operation at 0.63 micron. Author (GRA)

N85-16161# Laser Inst. of America, Toledo, Ohio.
LASER R AND D IN THE ARMED SERVICES Annual Summary Report, 15 Sep. 1983 - 15 Sep. 1984
R. W. Seidel and J. L. Bromberg 15 Sep. 1984 9 p
(Contract N00014-83-C-0744; RR0-1107)
(AD-A146930) Avail: NTIS HC A02/MF A01 CSCL 20/5

During the year, September 15, 1983 - September 15, 1984, Dr. Joan Lisa Bromberg has investigated the history of the laser through the interviewing of laser industry pioneers and leaders in California's Bay area and the Murray Hill branch of AT & T's Bell Labs. The status of processing of the interviewee's tapes is listed. During the course of the first year of our project, Dr. Robert W. Seidel has investigated the history of military laser research and development through the exploitation of the Department of Defense's Research and Development data bases, including the Research and Development Plans, Work Unit Information Summaries, and the Technical Report Abstracts of the Defense Technical Information Center; published and unpublished technical reports of military laser research and development available through DTIC and at military installations; visits to military installations and research facilities holding manuscript materials relating to history of laser research and development; and formal and informal interviews with participants in military laser R&D projects. GRA

N85-16162# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.
DESIGN AND TESTING OF A REFRACTIVE LASER BEAM HOMOGENIZER Final Interim Report, Nov. 1982 - Feb. 1984
N. C. Fernelius, K. R. Bradley, and B. L. Hoekstra Sep. 1984 43 p
(AD-A146997; AFWAL-TR-84-4042) Avail: NTIS HC A03/MF A01 CSCL 20/6

A survey is made of various techniques to create a homogeneous or flat top laser beam profile. A refractive homogenizer was designed for use with a ND:YAG laser with output at its fundamental (1.06 micrometer) and frequency doubled (532 nm)

modes. The system consists of a 2X beam expander and two faceted cylindrical lenses with differing focal lengths. Each cylindrical lens focusses its input into a strip the width of a facet. By orienting their axes at a 90 degree angle and focussing them on the same plane, the beam is concentrated into a square focus. Formulae for calculating the facet angles are derived and a FORTRAN computer square focus. Formulae for calculating the facet angles are derived and a FORTRAN computer program was written to calculate them with a precision greater than one is able to fabricate them. GRA

N85-16163# Department of the Navy, Washington, D. C.
VISIBLE AND ULTRAVIOLET LASERS BASED ON EXCIMER TRANSITIONS IN THE HOMONUCLEAR HALOGENS Patent Application
J. G. Eden and K. P. Killeen, inventors (to Navy) Filed 28 Sep. 1984 8 p
(AD-D011311; US-Patent-Appl-SN-356814) Avail: NTIS HC A02/MF A01 CSCL 20/5

Visible and ultraviolet lasers are based on excimer transitions in the diatomic homonuclear halogen molecules. Electron beam pumping of argon and hydrogen iodide gas mixtures produces a strong green emission in I2 centered at 505 nm and a full width of half maximum (FWHM) of the gain spectrum of approximately 15 nm. The transition for the green I2 band is bound-to-free, so a laser on this transition is continuously tunable. The result is a room temperature excimer laser that is potentially tunable over a region of 150A in the blue-green. GRA

N85-16164# Department of the Navy, Washington, D. C.
PHASED LOCKED ARRAY LASER SYSTEMS Patent Application
J. F. Lam, inventor (to Navy) Filed 21 May 1984 13 p
(AD-D011317; US-Patent-Appl-SN-612528) Avail: NTIS HC A02/MF A01 CSCL 20/5

A phase locked array laser system encloses a set of laser oscillators by a sawtooth mirror or corner cube reflector on one side and a partially reflecting sawtooth mirror on the other side. The system is fully enclosed by having two mirrors or corner cube reflectors at the top and bottom ends of the partially reflecting sawtooth mirror to coherently couple each laser oscillator to the others. Author (GRA)

N85-16165# Department of the Navy, Washington, D. C.
A NEW FREE ELECTRON LASER USING A RELATIVISTIC BEAM WITH SPIRALLING ELECTRON Patent Application
T. C. Marshall, S. P. Schlesinger, A. A. Crossman, and S. C. Chen, inventors (to Navy) Filed 31 Jan. 1984 16 p
(AD-D011318; US-Patent-Appl-SN-575425) Avail: NTIS HC A02/MF A01 CSCL 20/5

A free electron laser (FEL) is described which is used for generating high power radiation in a region of increasing guiding magnetic field before injection into an undulating low magnetic field. It includes an electron beam propagating along a guiding magnetic field BO (approximately 10 kilo gauss) inside a hollow metallic tube used as a wave guide. Around the path of the beam, an undulator in the form of a bifilar helical winding or the like produces a periodic magnetic field B(1) (approximately 0.5 to 1.0 kG). The electron motion accordingly has a substantial transverse component and the motion at the cyclotron and undulator frequencies occurs. Due to the energy exchange between the gyrating component of electron motion and an electromagnetic wave already present in the hollow tube, radiation of a calculable frequency is amplified. Author (GRA)

N85-16166# Naval Research Lab., Washington, D. C.
SELF-GENERATED MAGNETIC FIELDS AND THERMAL FLUX INHIBITION
M. H. Emery and J. H. Gardner 28 Sep. 1984 15 p
(AD-A147405; NRL-MR-5440) Avail: NTIS HC A02/MF A01 CSCL 20/5

We show that the observed thermal flux inhibition in high intensity, short pulse laser-plasma interaction experiments can stem directly from the strong magnetic fields generated at the ablation layer as a result of laser asymmetries. The self-consistent modeling of magnetized thermal transport in this environment shows strong thermal flux inhibition as manifested by reduced ablation pressures, reduced implosion velocities, reduced classical absorption, density profile flattening and reduced mass ablation rates. Author (GRA)

N85-16167# Aerospace Corp., El Segundo, Calif. Aerophysics Lab.
PHOTOCHEMISTRY AND KINETICS OF THE O*2-HI SYSTEM
J. B. Koffend, C. E. Gardner, and R. F. Heidner, III 10 Sep. 1984 47 p
(Contract F04701-83-C-0084)
(AD-A147433; TR-0084(4610)-1; SD-TR-84-37) Avail: NTIS HC A03/MF A01 CSCL 20/5

Rate coefficients of less than 2 x 10 to the minus 17th power cc/molecule-sec and (2.7 + or - 1.0) x 10 to the minus 14th power cc/molecule-sec have been measured by flow tube techniques for HI quenching of O2(superscript/delta) and O2(superscript 1 sigma), respectively. In a separate experiment, the quantum yields of I(superscript 2P subscript 1/2) from HI and CF3I photolysis at 249 nm were determined to be (0.65 + or - 0.04) and (0.88 + or - 0.06), respectively, relative to a quantum yield of 1.0 from the photolysis of n-C3F7I. The quenching rate of I by HI was determined to the (5.7 + or - 1.0) x 10 to the minus 14th power cc)/molecule-sec. Experimental data and modeling results are presented for photolysis of a mixture of O2 and HI. These data are relevant to consideration of a pulsed version of the chemical oxygen-iodine laser (COIL). GRA

N85-16168# Hampton Inst., Va. Dept. of Physics and Engineering Studies.
INTENSE EXCITATION SOURCE OF BLUE-GREEN LASER Annual Summary Report, 1 Oct. 1983 - 30 Sep. 1984
K. S. Han 15 Oct. 1984 9 p
(Contract N00014-80-C-0957)
(AD-A147450) Avail: NTIS HC A02/MF A01 CSCL 20/5

Under a grant an intense excitation of a blue-green laser useful for underwater communication and detection system is being developed. The source in use, hypocycloidal-pinch plasma, can produce near uv photons which match the absorption spectra of solid state blue-green lasers such as Tb:YLF and dye lasers. The optical pumping method is efficient and simple for exciting short pulse lasers repetitively without coupling capacitor energy directly the laser medium. This document reports on progress made. GRA

N85-16169# Kigre, Inc., Toledo, Ohio.
THE DEVELOPMENT OF A HIGH AVERAGE POWER GLASS LASER SOURCE Final Report, 13 Jul. 1981 - 31 Mar. 1984
J. D. Myers 31 May 1984 149 p
(Contract N00014-81-C-2376)
(AD-A147471) Avail: NTIS HC A07/MF A01 CSCL 20/5

The subject contract has as its objective the development of a high average power glass laser by systematically improving the factors which influence the ability of a laser glass to handle large power levels. Based upon the availability of the thermal laser glass composition Q-100, the rationale used was toward the improvement of the efficiency of a glass laser by developing methods to increase the pumping efficiency and toward the improvement of the power handling capability of the glass laser rod itself. These incremental developments were broken down as follows: (1) Characterization of Q-100 Laser Glass: The measurement of its thermo-physical and thermo-optical properties to better define its engineering design parameters. (2) Improve Pumping Efficiency or Q-100: Primarily by cladding Q-100 with a matching cladding glass which would act as a lens and improve the transfer of pumping energy from the flashlamp. (3) Reduce thermal loading of Q-100 by Selective filtering of the flashlamp radiation and/or use energy transfer schemes to increase that portion of the flashlamp radiation corresponding to the neodymium pump bands. (4) Increase the rupture strength of Q-100 to directly increase its power-handling capability. (5) Investigate alternate pump sources to improve efficiency. GRA

N85-16170# IBM Research Lab., San Jose, Calif.
NONCONTACT PHOTO-THERMAL PROBE-BEAM DEFLECTION MEASUREMENT OF THERMAL DIFFUSIVITY IN AN CONFINED HOT GAS
J. C. Loulergue and A. C. Tam 17 Oct. 1984 18 p
(Contract N00014-83-C-0170)
(AD-A147481; RJ-4472(48260)) Avail: NTIS HC A02/MF A01 CSCL 20/5

A pulsed carbon dioxide beam is used to produce a transient thermal refractive-index-gradient in nitrogen gas doped with trace amounts of absorbing Freon 12 at temperatures from 25 C to 425 C. The diffusion of this gradient is probed by a continuous HeNe laser beam parallel but displaced from the pulsed beam. The observed deflection signal agrees well with the theory of Jacson et al. (1981), and signal. GRA

N85-16171# Avco Government Products Group, Lowell, Mass.
PULSED ELECTRIC DISCHARGE LASER TECHNOLOGY. ELECTRON BEAM WINDOW FOIL MATERIAL Final Report, 28 Jan. 1983 - 15 Jan. 1984
M. W. McGeoch, A. J. DeFuria, and C. T. Pike Jan. 1984 117 p
(Contract DAAH01-82-D-A013)
(AD-A147488; AD-E950610; DRSMI/RH-CR-84-13) Avail: NTIS HC A06/MF A01 CSCL 20/5

An experimental and theoretical study of titanium alloy foil windows is described. The alloys considered are Ti 15-3-3-3, Ti 3-2.5, and CP Ti(4). The foil thickness ranges from 0.5 mil to 1.0 mil. Tensile strength data is presented for 75 F and 600 F. High-cycle (10 to the 7th power) fatigue data is presented to Ti 15-3-3-3 and Ti 3-2.5 at 75 F and 600 F. Crystal structures are shown for all the alloys. Measurements of the biaxial, or membrane, strength of the alloys is presented. A simulation of laser pulsed overpressure conditions is described, and the foil fatigue under these conditions is documented. The stresses in pressure loaded foil windows were calculated by the finite element method, both for static and dynamic loading. The shape of the foil support rib was optimized to minimize the foil stresses. A correlation was performed between the computed stress cycling under pulsed loading and the measured fatigue strength in uniaxial tension. As a check on the pulse simulation, the actual movement of an electron-beam foil window was measured by interferometry. A speckle interferometer which allows measurement of the movement of unpolished foil surfaces is described. Author (GRA)

N85-16172# Rochester Univ., N. Y. Dept. of Chemistry.
THEORETICAL STUDY OF LASER-INDUCED SURFACE EXCITATIONS ON A GRATING Interim Report
Ki-Tung Lee and Thomas F. George Nov. 1984 32 p
(Contract N00014-80-C-0472; NR Proj. 056-749)
(AD-A147855; UROCHESTER/DC/84/TR-57) Avail: NTIS HC A03/MF A01 CSCL 20/5

Laser-induced surface excitations on a grating are studied in terms of the solution to Maxwell's equations. A rigorous theory, derived originally for a lamellar grating, is used to study the resonance phenomenon for deep gratings. The generalization of the square-well grating to gratings of arbitrary shapes is examined numerically. A new diffraction anomaly is seen to occur when the grating depth is approximately equal to half of the wavelength of the incident laser radiation. GRA

N85-16173# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
LASER IGNITION OF EXPLOSIVES
Henric Oestmark Sep. 1984 37 p refs In SWEDISH; ENGLISH summary
(FOA-C-20550-D1; ISSN-0347-3694) Avail: NTIS HC A03/MF A01

Laser ignition of thermal explosions, laser ignition of detonation, and laser sensitivity analysis are reviewed. The theory of thermal explosion is outlined. Methods for the understanding of the ignition process are described, e.g., laser induced fluorescence and the determination of intermediate molecules arising in flames, Raman spectroscopy coherent anti-Stokes Raman scattering spectroscopy, and laser pyrolysis are considered. Author (ESA)

37 MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N85-16174 United Kingdom Atomic Energy Authority, Dounreay (Scotland).
THEORETICAL AND EXPERIMENTAL STUDY OF HYDRO-ELASTIC INSTABILITY ON THE LINE OF SHAFTING OF A ROTATING MACHINE Thesis - Paris Univ.
T. Fakhfakh 3 Sep. 1984 4 p Transl. into ENGLISH from French Thesis
(BLL-Dounreay-Tr-937-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

The movement of a rotating cylinder partially filled with a liquid on an elastic shaft is formulated into an equation. Tests are described which allow the equation to be validated. The effect of different parameters on the stability and behavior of the system are determined (level of liquid, viscosity, speed of rotation, and critical speed of the shaft). B.G.

N85-16175 British Library Lending Div., Boston Spa (England).
IMPROVEMENT OF GAS-TIGHTNESS OF OTTG AND TBO-5 THREADED PIPE COUPLINGS
P. E. Osipenko, Yu. V. Yakubovich, and G. V. Chizhov 3 Dec. 1984 5 p Transl. into ENGLISH from Stal (USSR), no. 5, 1984 p 48
(BLL-M-35993-(5828.4)) Avail: British Library Lending Div., Boston Spa, England

Full contact between the OTTG and TBO threads at the inside thrust faces during the production of high strength upset pipes were achieved. This contact establishes the desired casing tightness of the coupling and ensures that the surface of the inside channel formed by a string of tubes is gap free; a high gas tightness at a working pressure of 80 to 100 MPa is produced for tubes in the M and R-strength groups. E.A.K.

N85-16176 Department of the Air Force, Washington, D.C.
THERMALLY ISOLATED STRUCTURAL SUPPORT LINK Patent
C. H. Lang, inventor (to Air Force) 14 Aug. 1984 7 p Supersedes AD-D008876
(AD-D011349; US-Patent-4,465,392; US-Patent-Appl-SN-272861; US-Patent-Class-403-24) Avail: US Patent and Trademark Office CSCL 13/1

A thermally isolated structural support link has a tube-like support element, a pair of bearing housings being fixedly secured within each end of the support element, respectively, by an exceptionally strong adhesive, and a spherical monoball bearing affixed within each bearing housing by an exceptionally strong adhesive. Each bearing housing is made of a pair of substantially identical bearing casings which support there between the bearing. The tube-like element, bearing housing and adhesive all are made of a material having excellent thermal isolation properties in order to provide not only thermal isolation between components of an assembly but also excellent supportive strength. GRA

N85-16177 Department of the Air Force, Washington, D.C.
FLEXIBLE LINE SUPPORT ASSEMBLY Patent
C. H. Lang and M. S. Biss, inventors (to Air Force) Issued 14 Aug. 1984 5 p Supersedes AD-D010289
(AD-D011391; US-Patent-4,465,253; US-Patent-Appl-SN-486598; US-Patent-Class-248-75) Avail: US Patent and Trademark Office CSCL 13/5

An assembly for supporting a flexible service line between a base structure and an object body mounted to the base structure for movement about lateral and elevation gimbal axes is described which includes lateral and elevation drums fixedly mounted to the body and base structure, respectively, and an arm interconnecting

the drums. A spiral groove is defined in the periphery of each drum for receiving looped portions of the line extending between its looped portions. Also, the arm is rotatably mounted at its opposite ends to the drums for accommodating relative movement between the body and base structure about the respective gimbal axes. The looped portions of the flexible lines are confined in the grooves on the drums and may expand and contract therein as the body moves relative to the base structure about the gimbal axes. GRA

N85-16178*# Stanford Univ., Calif.
PRECISE CONTROL OF FLEXIBLE MANIPULATORS Final Report, Mar. 1983 - Jun. 1984
Robert H. Cannon, Jr., Thomas O. Bindford, and Eric Schmitz Sep. 1984 53 p refs Original contains color illustrations
(Grant NAG1-322)
(NASA-CR-174210; NAS 1.26:174210) Avail: NTIS HC A04/MF A01 CSCL 05H

The design and experimental testing of end point position controllers for a very flexible one link lightweight manipulator are summarized. The latest upgraded version of the experimental set up, and the basic differences between conventional joint angle feedback and end point position feedback are described. A general procedure for application of modern control methods to the problem is outlined. The relationship between weighting parameters and the bandwidth and control stiffness of the resulting end point position closed loop system is shown. It is found that joint rate angle feedback in addition to the primary end point position sensor is essential for adequate disturbance rejection capability of the closed loop system. The use of a low order multivariable compensator design computer code; called Sandy is documented. A solution to the problem of control mode switching between position sensor sets is outlined. The proof of concept for endpoint position feedback for a one link flexible manipulator was demonstrated. The bandwidth obtained with the experimental end point position controller is about twice as fast as the beam's first natural cantilevered frequency, and comes within a factor of four of the absolute physical speed limit imposed by the wave propagation time of the beam. E.A.K.

N85-16179# Rensselaer Polytechnic Inst., Troy, N. Y. School of Engineering.
AN AUTONOMOUS ROVING VEHICLE FOR THE PLANET MARS: A SUMMARY OF OVER 15 YEARS OF RESEARCH
Dean K. Frederick Oct. 1984 71 p refs
(RPI-TR-MP-83) Avail: NTIS HC A04/MF A01

A vehicle intended for use on Mars was under development since 1967. An overview of the project is presented. The early efforts were directed chiefly toward deployment, structural, and suspension problems, and resulted in a storage battery powered vehicle that served as a test bed for later developments. The next phase involved the development of a primitive vision system for detecting obstacles. This consisted of a pulsed laser source and single photodetector both mounted on the same mast. Information is processed and used to guide the vehicle by means of telemetry and a remote computer. Results of extensive testing of this vehicle are summarized. A more sophisticated vision system was subsequently developed that continues to use triangulation as a basic feature, but scans the terrain ahead in two dimensions. The improved telemetry system and other hardware and software improvements are discussed, along with some fixed position test results for this vision system. R.S.F.

N85-16180*# National Aeronautics and Space Administration, Washington, D. C.
CLEARANCE FLOW-GENERATED TRANSVERSE FORCES AT THE ROTORS OF THERMAL TURBOMACHINES Ph.D. Thesis - Technische Univ., 1975
Karl Urlichs Oct. 1983 181 p refs Transl. into ENGLISH of "Durch Spaltstroemungen Hervorgerufene Querkraefte an den Laufern Thermischer Turbomaschinen", Munich p 1-159 Original language document was announced in IAA as A76-43249 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-77292; NAS 1.15:77292) Avail: NTIS HC A09/MF A01 CSCL 13I

Self-excited rotor whirl represents a serious hazard in the operation of turbomachines. The reported investigation has, therefore, the objective to measure the lateral forces acting on the rotor and to determine the characteristic pressure distribution in the rotor clearance area. A description is presented of an approach for calculating the leakage flow in the case of an eccentric rotor position on the basis of empirical loss coefficients. The results are reported of an experimental investigation with a turbine stage, taking into account a variation of the clearance characteristics. The pressure data measured are consistent with the theoretical considerations. G.R. (IAA)

N85-16181*# Lockheed Missiles and Space Co., Huntsville, Ala. Research and Development Div.
BEARING TESTER FIT ANALYSIS
11 Dec. 1984 75 p
(Contract NAS8-34978)
(NASA-CR-171282; NAS 1.26:171282; LMSC-HREC-TN-D951714)
Avail: NTIS HC A04/MF A01 CSCL 13I

A NASTRAN model of the Bearing Tester was developed to determine the fit of its components while in use. The model was executed for three loading conditions involving appropriate thermal and pressure loading throughout: rotation (30,000 rpm), rotation with 5000 lb axial shaft loading, and rotation with 2000 lb lateral shaft loading. A 30 deg slice of the Bearing Tester was modeled with solid isoparametric elements (CIHEX). Five more slices were generated to form a 180 deg symmetrical half. Each component was modeled separately for two reasons: (1) in the heat transfer version each component required covering with appropriate heat transfer coefficient elements, and (2) for the displacement version each component required independent radial expansion with respect to adjacent components. The components are connected at fastener and bearing locations axially and/or tangentially. Differences in radial displacements of adjacent cylindrical surfaces were calculated and added to those differences calculated for 180 deg opposite locations to determine the diametric change. B.W.

N85-16182# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
A MACHINE FOR WEIGHT-LIFT TESTING Final Report, 1 Jun. 1983 - 1 Feb. 1984
N. M. Aume Aug. 1984 43 p
(AF Proj. 7184)
(AD-A146816; AFAMRL-TR-84-040) Avail: NTIS HC A03/MF A01 CSCL 06/14

This report describes the design and building details of a weight lifting machine which is primarily intended for Factor X testing where only occasional use is foreseen and an expensive machine would not be cost effective. The machine allows one to select, in 10 pound increments, a weight from 40 to 200 pounds for lifting. The design of the machine allows the weight to move only up and down, eliminating any unwanted and hazardous motions. Author (GRA)

N85-16183# Department of the Navy, Washington, D. C.
MULTI-DIRECTIONAL STRADDLE-LIFT CARRIER Patent Application
S. R. Petoia, inventor (to Navy) Filed 2 Nov. 1983 20 p
(AD-D011315; US-Patent-Appl-SN-548047) Avail: NTIS HC A02/MF A01 CSCL 13/3

A straddle-lift carrier for transporting long heavy loads, having adjustable width for accommodating various size loads and for compacting the carrier for storage. The adjustable width allows the carrier to negotiate relatively narrow passages. A high degree of mansuverability is achieved by utilization of independently driven and steered traction wheels. Raising and lowering of loads is accomplished by hydraulically operated forklift mechanisms disposed on either side of the carrier. Operation of the carrier is controlled by means of a handheld remote control unit. GRA

N85-16184# Army Research and Development Lab., Fort Belvoir, Va.
GREASE VERSUS OIL LUBRICATION OF WHEEL BEARINGS IN ARMY EQUIPMENT Final Report
C. C. Chapin, J. L. Beeson, and D. A. Brown Jan. 1984 23 p
(DA Proj. 1L7-62733-AH-20)
(AD-A147546; BRDC-2396) Avail: NTIS HC A02/MF A01 CSCL 11/8

The US Army has the largest fleet of ground equipment in the United States. The number of vehicles is in the hundreds of thousands, and there are many types ranging from cars, trucks, and buses to a variety of tracked, wheeled, and mechanical/construction equipment and trailers. The mobility doctrine has led DoD to install wheels on many types of equipment so that all support activities, in addition to combat operations, can be performed locally in the field. These cars, trucks, buses, etc., are procured both commercially (off-the-shelf adoption for Army use) and through development programs in which contractors design and build equipment such as combat and tactical vehicles for Army use according to specifications developed by the Army. Wheel bearings are present in all of these vehicles, and the US Army has used grease lubrication of wheel bearings for many years. However, in some instances oil has been used for lubrication of these bearings. This is common practices for commercial axles, and this approach is continuing to be used more frequently by contractors and developing agencies as well. The advantages of oil as opposed to grease are higher operating temperatures and better heat transfer properties. The current technology in grease manufacture, however, extends the upper temperature limits of grease up to and beyond that of some oils. Thus, grease is the lubricant of choice for the lubrication of wheel bearings in Army equipment. GRA

N85-16185# Army Research and Development Lab., Fort Belvoir, Va.
COOLING SYSTEM INVESTIGATION OF THE 3-kW MEP MODELS 016A, 021A, AND 026A (60Hz, 400-Hz AND 28-V dc) GASOLINE-ENGINE-DRIVEN GENERATOR SETS
W. A. Summerson Dec. 1983 30 p
(AD-A147571; BRDC-2394) Avail: NTIS HC A03/MF A01 CSCL 13/1

The purpose of this report is to describe the characteristics of the cooling system on the MIL STD 3-kW, Models MEP 016A (60-Hz), 021A (400-Hz), and 026A (28-V d.c.) gasoline-engine-driven generator sets from the viewpoint of design modifications necessary to alleviate chronic engine overheating problems experienced when the sets are operated in high ambient temperatures and/or operated in revetted (walled) locations. The investigation covers the history of the cooling system on the Model 4A032 6-hp MIL STD engine and how the cooling system was altered and compromised when the engine was applied to 3-kW generator set. The report describes experimental modifications made to the set cooling system which allowed the set to be operated inside an acoustic enclosure without overheating the engine. These improvements to the engine and generator cooling systems could be considered for incorporation into future production 3-kW MIL STD gasoline-engine-driven generator sets. Author (GRA)

N85-16186# Navy Experimental Diving Unit, Panama City, Fla.
EVALUATION OF THE KERIE CABLE THERMAL ARC CUTTING EQUIPMENT
S. J. Trukken Jul. 1984 20 p
(AD-A147813; NEDU-7-84) Avail: NTIS HC A02/MF A01 CSCL 13/8

From 16-26 April 1984, the Navy Experimental Diving Unit (NEDU) conducted testing on the CLUCAS Underwater Kerie Cable thermal cutting equipment at A dock, Pearl Harbor, Hawaii. The purpose of this testing was to verify Navy procedures for set up, use and maintenance, evaluate diver and equipment hazards, identify proper procedural corrections for identified hazards and provide a recommendation for training procedures. The Kerie Cable has similar hazards as other cutting equipment with acceptable safety margins. The procedures established proved to be effective and safe. The fleet will require only minimal training for safe and effective cutting. The CLUCAS Underwater Kerie Cable thermal cutting equipment is considered to be reliable, safe and an effective means of thermal cutting. GRA

N85-16187# Tennessee Univ., Knoxville.
AUTOMATIC CAMERA TRACKING FOR REMOTE MANIPULATORS
R. S. Stroughton, H. L. Martin, (ORNL, Tenn.), and R. R. Bentz, (ORNL, Tenn.) Jul. 1984 12 p refs Presented at the USDOE/ORNL/PNC Natl. Topical Meeting on Robotics and Remote Handling in Hostile Environ., Tokyo, 24 Jul. 1984
(Contracts DE-AC05-84OR-21400; W-7405-eng-26)
(DE85-001897; CONF-840793-5) Avail: NTIS HC A02/MF A01

The problem of automatic camera tracking of mobile objects is addressed with specific reference to remote manipulators and using either fixed or mobile cameras. The technique uses a kinematic approach employing 4x4 coordinate transformation matrices to sole for the needed camera and angles. No vision feedback systems are used, as the required input data are obtained entirely from position sensors from the manipulator and the camera positioning system. All hardware requirements are generally satisfied by currently available remote manipulator systems with a supervisory computer. The system discussed here implements linear plus on/off (bang-bang) closed loop control with a plus or minus 2 deg deadband. The deadband area is desirable to avoid operator seasickness caused by continuous camera movement. Programming considerations for camera control, including operator interface options, are discussed. The example problem presented is based on an actual implementation using a PDP 11/34 computer, a TeleOperator Systems SM-229 manipulator, and an Oak Ridge National Laboratory (ORNL) camera positioning system. DOE

N85-16188# California Univ., Livermore. Lawrence Livermore Lab.
POWER OF DETERMINISTIC THINKING IN MACHINE TOOL ACCURACY
James B. Bryan Sep. 1984 16 p refs Presented at the 1st Intern. Mach. Tool Engr. Conf., Tokyo, 7-8 Nov. 1984
(Contract W-7405-eng-48)
(DE85-001751; UCRL-91531; CONF-841196-1) Avail: NTIS HC A02/MF A01

Philosophy is an important factor in precision engineering and the upgrading of machine tool accuracy. The philosophy presented evolved from the history of the field, experience, and advice. The main elements of this philosophy are outlined, they are: patience, continuity of effort, good measuring equipment, good temperature control, carefully designed tests, and belief in the idea that machine tools obey cause and effect relationships and are random or probabilistic in their behavior. DOE

N85-16189# Du Pont de Nemours (E. I.) and Co., Aiken, S.C.
RESIDUAL STRESSES AT SMALL DIFFUSION WELDS
D. G. Berghaus (Georgia Inst. of Technology, Atlanta) 1984 13 p refs Presented at the Spring Conf. on Experimental Mech., Las Vegas, Nev., 9-13 Jun. 1985
(Contract DE-AC09-76SR-00001)
(DE84-014982; DP-MS-84-70; CONF-850608-1) Avail: NTIS HC A02/MF A01

Residual stresses produced during the welding closure of small stainless steel tubes were measured by a strain gage method. The method requires an axis of symmetry in the specimen at the point of interest and permits the use of single element gages if two or more specimens are available. Results for three different currents are presented. DOE

N85-16190# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
REPAIR WELDING AND BRAZING PROCEDURES FOR TURBINE COMPONENTS AND INVESTIGATION OF THE BRAZING BEHAVIOR OF THIN FILLER FOILS European Concerted Action. COST 50 - Materials for Gas Turbines, Project III,

D10/11 [REPARATURLOET- UND SCHWEISSVERFAHREN FUER TURBINENKOMPONENTEN UND UNTERSUCHUNG DES LOETVERHALTEN BINDEMITTELFREIER LOTFOLIEN]
H. Wilhelm 7 Jun. 1984 75 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(MTU-TB-908/84) Avail: NTIS HC A04/MF A01

Repair welding and brazing procedures for damaged gas turbine blades and vanes were developed. Thermal fatigue cracks on vanes and worn labyrinth seals on blade platforms were repaired. Brazing behavior of thin filler foils was investigated. Remaining oxides impair the wetting behavior of the filler and are suppressed by deoxidizing heat treatments. Different mixtures of filler and alloy powder were tested in gaps of different width. The lifetime of the repaired vanes in thermal fatigue tests is similar to new components. Complete replacement of damaged leading and trailing edges using thin brazing foils is successful for plane joint surfaces. Thin filler foils (AMS 4776, 4778, etc) were used for brazing PD16, M246, IN100. Extensive metallographic and mechanical testing were carried out. Static strength of the brazed joints is 10% or 15% lower than for the base material while stress rupture properties are considerably lower. Author (ESA)

N85-16191# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
WELDING OF PM-SUPERALLOYS European Concerted Action. COST 50 - Materials for Gas Turbines, Project D9. Final Report [SCHWEISSEN VON PM-SUPERLEGIERLUNGEN]
H. Wilhelm 17 Feb. 1984 66 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(MTU-TB-910/84) Avail: NTIS HC A04/MF A01

Investigations of electron beam (EB) and inertia welding of technically important PM-superalloys were carried out. Optimization of welding parameters, evaluation of suitable heat treatments before and after welding, and investigation of strength properties of welded samples are outlined. The materials APK7, Rene 95 PM and Merl 76 are very susceptible to hot cracking and are not suitable for fusion welding. The EB-weldability of AP1 is difficult to judge. In any case AP1 is near the limit of fusion-weldability in terms of cracking. All test materials are suitable for inertia welding if there are few impurities at the particle boundaries and no oxide inclusions. Author (ESA)

N85-16192# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Hardthausen (West Germany). Inst. fuer Chemische Antriebe und Verfahrenstechnik.
NONLINEAR CONTROL MODEL OF AN H2O STEAM REACTOR Ph.D. Thesis - Karlsruhe Univ.
Karlheinz Wolfmueller Jul. 1984 124 p refs In GERMAN; ENGLISH summary Translation is in process
(DFVLR-FB-84-30) Avail: NTIS HC A06/MF A01; DFVLR, Cologne DM 40

The process of fast steam generation via the combustion of H2 with O2 is investigated with respect to dynamic and control aspects. A nonlinear dynamic model is presented. The reduction of the order of the system for a controller synthesis is reached by structural assignment and suitable determination of the model parameters. A nonlinear decoupling method is described and a controller design is performed with respect to measured disturbances. The method is verified by numerical simulations. Specifications of the control system and the design method are verified by experimental results with the test rig. Author (ESA)

N85-16193# Research Inst. of National Defence, Stockholm (Sweden). Human Studies Dept.
COMPARISON BETWEEN CYCLE ERGOMETERS WITH DIFFERENT MECHANICAL BRAKING SYSTEMS
Ulf Bergh Sep. 1984 30 p refs In SWEDISH; ENGLISH summary
(FOA-C-54058-H1; ISSN-0347-7665) Avail: NTIS HC A03/MF A01

Construction and function during submaximal tests of a weight ergometer with a partial compensation of the friction revolution; (2) a pendulum scale ergometer where the weighing machine gives the friction difference between the brake-band and the wheel; (3) a weight ergometer where the force is measured in the braking part sustaining the hanging weight; and (4) a weight ergometer with a longer friction belt (16 rad) were assessed. Type 2 is more reproducable as to the energy demand at a given work rate. Type 3 is more sensitive to changes in the coefficient of friction compared to types 1 and 4, which are equally sensitive. Compared to type 2 the braking power is 3% to 15%, 0% to 6% and 1% to 5% lower in types 1, 3, and 4 respectively. These figures are highest at high work levels. Author (ESA)

N85-15933# Joint Publications Research Service, Arlington, Va.
FIAT, PEUGEOT INTRODUCE INTEGRATED ROBOTIZED ENGINE: CAD USED
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 16-19 Transl. into ENGLISH from Il Tempo (Rome), 19 Sep. 1984 p 15 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

38 QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

N85-16194 United Kingdom Atomic Energy Authority, Risley (England).
COMPARISON OF THE SENSITIVITIES OF ULTRASONIC, RADIOGRAPHIC AND ACOUSTIC EMISSION TEST METHODS FOR THE EXAMINATION OF A THICK WELD
F. Bodson, J. P. Launay, M. Asty, and C. Birac 9 Nov. 1984 16 p Transl. into ENGLISH of conf. paper "Comparaison des Sensibilites des Methodes de Controle Utilisant les Ultrasons, la Radiographie et l'Emission Acoustique pour l'Examen d'une Soudure Epaisse" presented at the 2nd Intern. Conf. on NDT, 1981 Conf. held in Vienna, 14-16 Sep. 1981
(BLL-Risley-Tr-4547-(9091.9F)) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

Several non-destructive test methods (radiographic, manual ultrasonic, focused ultrasonic and acoustic emission testing) and destructive examination for inspection of a thick weldment made of A 533 grB (16 MND 5) steel are compared. Author

N85-16195*# Ohio State Univ., Columbus.
FUNDAMENTALS OF MICROCRACK NUCLEATION MECHANICS Final Report
L. S. Fu, Y. C. Sheu, C. M. Co, W. F. Zhong, and H. D. Shen NASA Washington Jan. 1985 86 p refs
(Grant NAG3-340)
(NASA-CR-3851; E-2296; NAS 1.26:3851; RFP763340/714952) Avail: NTIS HC A05/MF A01 CSCL 20K

A foundation for ultrasonic evaluation of microcrack nucleation mechanics is identified in order to establish a basis for correlations between plane strain fracture toughness and ultrasonic factors through the interaction of elastic waves with material microstructures. Since microcracking is the origin of (brittle) fracture, it is appropriate to consider the role of stress waves in the dynamics of microcracking. Therefore, the following topics are discussed: (1) microstress distributions with typical microstructural defects located in the stress field; (2) elastic wave scattering from various idealized defects; and (3) dynamic effective-properties of media with randomly distributed inhomogeneities. R.S.F.

N85-16196# Air Force Human Resources Lab., Brooks AFB, Tex.
NONDESTRUCTIVE INSPECTION: IMPROVED CAPABILITIES OF TECHNICIANS Final Report
R. H. Summers Oct. 1984 21 p
(AD-A147388; AFHRL-TP-83-63) Avail: NTIS HC A02/MF A01

CSCL 05/9

This report covers two research and development (R&D) efforts relating to non-destructive inspection (NDI) in the Air Force. Recent surveys have found Air Force NDI capability to lack the precision and reliability necessary to ensure the structural integrity of aircraft. In one of these R&D efforts, specifications were developed for a trainer that would allow NDI technicians to learn and practice the ultrasonic NDI technique on the job. Functional specifications were developed first, based on technician-trainer interaction requirements, and then they were converted to engineering specifications for acquisition purposes. In the other R&D effort reported here, a study was made of relationships between personnel information on NDI technicians and their inspection abilities. The results from extensive eddy current and ultrasonic inspection tests were paired with data on experience, attitudes, and training. No significant relationships were found between NDI abilities and selected personnel features. The specifications for the NDI trainer have potentially wide applicability throughout the military and civilian NDI communities. Results of the survey of personnel information, paired with NDI performance scores, holds interest for the personnel selection system. There is apparently little advantage to prior airframe or metals experience, and neither the volunteer nor the non-volunteer performs inspections with an edge in precision or reliability. The underlying conclusion seems to add weight to the premise that additional practice at the job site is the best approach to improving NDI capability. GRA

N85-16197# Oak Ridge Y-12 Plant, Tenn.
ULTRASONIC ANALYSIS OF SPHERICAL COMPOSITE TEST SPECIMENS
W. D. Brosey 22 Aug. 1984 31 p refs Presented at the Intern. Symp. Composites on Mater. and Eng., Newark, Del., 24-28 Sep. 1984
(Contract DE-AC05-84OS-21400)
(DE85-001591; Y/DW-474; CONF-8409132-1) Avail: NTIS HC A03/MF A01

Filament wound spherical test specimens were examined ultrasonically to determine the effectiveness of various nondestructive evaluation techniques for analysis of mechanical characteristics of a composite with enclosed geometry. The Kevlar-epoxy composite specimens contained simulated defect conditions which were located, and the extent of damage determined, by ultrasonic analysis. Effects of transducer frequency and signal parameters were examined to determine optimum conditions for flaw detection. The data are displayed in rectangular and axonometric projection. DOE

N85-16198# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
POSSIBILITIES FOR A MORE ACCURATE LIFE PREDICTION OF COMPONENTS European Concerted Action. Cost 50 - Materials for Gas Turbines, Project D14. Final Report, 31 Dec. 1984
Barbara Borchert, Gerhard Koenig, and Herbert Schmid May 1984 52 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
Avail: NTIS HC A04/MF A01

The low cycle fatigue (LCF) life of gas turbine disks tested in a spin test was compared with LCF sample testing for Inconel 718 and Waspoloy at 600C. Results of load controlled notched samples are in good agreement with the spin test. Without dwell time, Inconel 718 is superior to Waspoloy, but with dwell time the LCF life of Inconel 718 is reduced, in contrast to Waspoloy where no detrimental effect is found. The life reduction of Inconel 718 by dwell time cannot be predicted by the strain controlled specimens. Life predictions computed from strain controlled smooth specimens deviate conservatively by a factor 2 to 3. Author (ESA)

N85-15746# Brown Boveri Research Center, Baden (Switzerland).
EXPERIENCES WITH THE MATERIAL BEVAVIOUR AND HIGH TEMPERATURE LOW CYCLE FATIGUE LIFE PREDICTION OF THE IN 738 BLADING ALLOY
M. Y. Nazmy, H. Wettstein, and A. Wicki (Brown, Boveri and Co. Ltd, Baden, Switzerland) *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 12 p refs (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

N85-15747# Rolls-Royce Ltd., Derby (England).
CYCLIC ENDURANCE TESTING OF THE RB211-22B CAST HP TURBINE BLADE
J. S. Ponsford and G. K. Waddington *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 11 p (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

N85-15748# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Turbine Engine Div.
VERIFICATION OF LIFE PREDICTION THROUGH COMPONENT TESTING
Richard J. Hill *In* AGARD Eng. Cyclic Durability by Analysis and Testing Sep. 1984 9 p (For primary document see N85-15733 07-07)
Avail: NTIS HC A12/MF A01

N85-15934# Joint Publications Research Service, Arlington, Va.
GALLIUM ARSENIDE COMPOUNDS TESTED NONDESTRUCTIVELY WITH X-RAYS
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 34-35 Transl. into ENGLISH from Frankfurter Zeitung/Blick Durch Die Wirtschaft (Frankfurt/Main), 8 Oct. 1984 p 7 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

39 STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.

For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance.*

N85-16199# United Kingdom Atomic Energy Authority, Risley (England).
NONDESTRUCTIVE TESTS AND FRACTURE MECHANICS INVESTIGATIONS IN THE COMPONENT INTEGRITY RESEARCH PROGRAMME
G. Deuster and L. Issler 9 Nov. 1984 47 p refs Transl. into ENGLISH of conf. paper "Zerstoerungsfreie Pruefungen und Bruchmechanische Untersuchungen im Rahmen des Forschungsvorhabens Komponentensicherheit", West Germany 48 p Presented at the 4th Intern. Conf. on Nondestructive Testing in Nucl. Technol., Lindau, West Germany, 25-27 May 1981
(BLL-Risley-Tr-4541-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

Nondestructive and destructive tests form part of large scale experiments. The effectiveness of detection and analysis techniques for surface and internal defects and for assessing the material structure is described. Nondestructive methods used in loading tests are considered. Defect detectability in relation to fracture mechanics evaluation of material and defect condition is discussed. Author

N85-16200# Shock and Vibration Information Center (Defense), Washington, D. C.
THE SHOCK AND VIBRATION DIGEST, VOLUME 16, NO. 9 Monthly Report
Judith Nagle-Eshleman, ed. Sep. 1984 105 p refs
(AD-A146779) Avail: SVIC, Code 5804, Naval Research Lab., Washington, D.C. 20375 CSCL 20/11

Techniques for nonlinear random vibration problems are considered along with a vibration analysis of highway bridges. Abstracts of published work in such areas as mechanical systems, structural systems, structural components, and analysis and design

are presented. Book reviews and new briefs are also provided. For individual titles, see N85-16201 through N85-16201.

N85-16201# Sussex Univ., Brighton (England). School of Engineering and Applied Sciences.
TECHNIQUES FOR NONLINEAR RANDOM VIBRATION PROBLEMS
J. B. Roberts *In* Shock and Vibration Information Center The Shock and Vibration Digest, Vol. 16, No. 9 Sep. 1984 p 3-14 refs (For primary document see N85-16200 07-39)
Avail: SVIC, Code 5804, Naval Research lab., Washington, D.C. 20375 CSCL 20/11

Methods for solving nonlinear stochastic problems in dynamics are discussed. Emphasis is placed on the application of these methods to engineering situations. The Fokker-Planck-Kolmogorov (FPK) equation is considered. R.S.F.

N85-16202 British Library Lending Div., Boston Spa (England).
DAMPING CAPACITY OF MULTILAYER TUBE DURING TORSION
V. N. Brinza, B. S. Vekshin, and L. G. Shapovalova 3 Dec. 1984 7 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved., Chernaya Met. (USSR), no. 5, 1984 p 83-85
(BLL-M-36011-(5828.4)) Avail: British Library Lending Div., Boston Spa, England

A design formula for calculating vibration decrement for a multilayer rod and tube when the vibration decrements of each layer are known was obtained. It was found that external damping layer on the tube is the most efficient and that the relative increase in the vibration decrement is considerably greater than the increase in the outer coating thickness. E.A.K.

N85-16203# United Kingdom Atomic Energy Authority, Harwell (England). Materials Physics and Metallurgy Div.
QUANTITATIVE ACOUSTIC EMISSION TECHNIQUES
C. B. Scruby Jul. 1984 113 p refs
(AERE-R-11262) Avail: NTIS HC A06/MF A01

The potential of acoustic emission as a method for remote detection and location of flaws in a wide range of engineering structures was studied. The basic physical principles underlying the fundamental approach to acoustic emission source characterization are reviewed, and it is shown that it can be used to deduce important and useful information about defect growth. Acoustic emission sources and their radiation of elastic wave energy, and elastic wave propagation are discussed. E.A.K.

N85-16204*# Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.
STRESSES IN PIN-LOADED ORTHOTROPIC PLATES USING PHOTOELASTICITY Contractor Report, Aug. 1981 - Oct. 1984
M. W. Hyer and D. Liu Oct. 1984 50 p refs Sponsored in part by Army
(Contract NsG-1621)
(NASA-CR-172498; NAS 1.26:172498) Avail: NTIS HC A03/MF A01 CSCL 20K

The stresses in transparent glass-epoxy plates loaded by a steel pin through a hole were determined by photoelasticity. The stresses around the hole edge, across the net section, along the shear out line, and on the centerline below the hole for quasiisotropic, unidirectional, and angle ply plates are outlined. Stresses in an isotropic comparison specimen are also presented. Stress concentration factors for several locations around the plates are tabulated. The experimental apparatus and the experimental technique are discussed. The isochromatic and isoclinic fringe patterns for the four plates are shown. A description of the necessary photoelastic theory is appended. E.A.K.

N85-16205*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL COMPLIANCE CALIBRATION OF THE NASA LEWIS RESEARCH CENTER MODE 2 FATIGUE SPECIMEN
Robert J. Buzzard 1985 11 p refs Proposed for presentation at the 18th Natl. Symp. on Fracture Mech., Boulder, Colo., 24-27 Jun. 1985; sponsored by American Society for Testing and Materials
(NASA-TM-86908; E-2398; NAS 1.15:86908) Avail: NTIS HC A02/MF A01 CSCL 20K

Calibration of the mode II aluminum fatigue specimen was performed experimentally to provide displacement and stress intensity coefficients over crack length to specimen width ratios (a/W) of 0.5 to 0.9. Displacements were measured both at the specimen notch mouth and at the intersection of the notch with the centerline of the loading pin holes. R.S.F.

N85-16206*# National Aeronautics and Space Administration, Washington, D. C.
BACK STRESS IN DISLOCATION CREEP. PART 1: BASIC CONCEPTS AND MEASURING TECHNIQUES
J. Cadek Apr. 1984 20 p refs Transl. into ENGLISH from Kovove Materialy (Czechoslovakia), v. 21, no. 5, 1983 p 518-531 Original language document was announced in IAA as A84-10173
(Contract NASw-3541)
(NASA-TM-77773; NAS 1.15:77773) Avail: NTIS HC A02/MF A01 CSCL 20K

A theory is proposed whereby the plastic deformation of metal materials is determined by the difference between the applied stress and the back stress which characterizes the resistance of the material to plastic deformation. The back stress is usually equivalent to the internal stress or the friction stress and depends on the magnitude of the applied stress and temperature. The concept of back stress is applied to the case of the dislocation creep of precipitation-hardened or dispersion-strengthened metal materials. An additivity rule is formulated which can be useful in interpreting the creep behavior of such materials. V.L. (IAA)

N85-16207*# National Aeronautics and Space Administration, Washington, D. C.
MEASUREMENT OF HIGH TEMPERATURE STRAIN BY THE LASER-SPECKLE STRAIN GAUGE
Ichirou Yamaguchi Dec. 1984 21 p refs Transl. into ENGLISH from Hi-Hokai Kensa (Japan), v. 32, no. 9, Sep. 1984 p 676-682 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-4004)
(NASA-TM-77751; NAS 1.15:77751) Avail: NTIS HC A02/MF A01 CSCL 20K

By using the laser-speckle strain gauge, the strain of metal at the temperature lower than 250 C is measured. The principle of the gauge is to measure the expansion or contraction of the fine structures of surface by detecting the resultant speckle displacement in an optoelectronic way, whereby the effect of rigid-body motion is automatically cancelled out with the aid of a differential detection system. A transportable apparatus was built and a comparison experiment performed with a resistance strain gauge at room temperature. It has a strain sensitivity of .00002, a gauge length smaller than 1 mm, and no upper limit in a range of strain measurement. In the measurement of high-temperature strain it is free from the need for a dummy gauge and insensitive to an electric drift effect. As examples of strain measurement at high-temperature, thermal expansion and contraction of a top of a soldering iron are measured. The interval of the measurement can be made at shortest 1.6 sec. and the change in the strain is clearly followed until the ultimate stationary temperature is reached. Author

N85-16208*# Lockheed Missiles and Space Co., Huntsville, Ala. Research and Development Div.
INVESTIGATION OF THE HPFTP FIRST STAGE IMPELLER CRACK
11 Dec. 1984 13 p
(Contract NAS8-34978)
(NASA-CR-171281; NAS 1.26:171281; LMSC-HREC-TN-D951725)
Avail: NTIS HC A02/MF A01 CSCL 20K

The occurrence of a crack in the HPFTP first stage impeller of pump 2608 R2 during test 750-245 prompted this analysis to examine possible causes of the failure. Preliminary analysis, using

an existing NASTRAN model of the impeller, showed a deficiency in the model's ability to reliably calculate stress in the area of concern (outboard edge of the impeller shroud). A new NASTRAN model was constructed to better define the stress state in the area of crack initiations. Static stress analysis and normal models analysis were performed on the new model. Results are presented. Author

N85-16209# Hughes (Thomas J. R.), Stanford, Calif.
FINITE ELEMENT PROCEDURES APPLICABLE TO NONLINEAR ANALYSIS OF REINFORCED CONCRETE SHELL STRUCTURES Final Report, Oct. 1982 - Apr. 1984
G. M. Stanley and T. J. R. Hughes Sep. 1984 68 p
(Contract N62583-82-M-T122; YR0-23003)
(AD-A146796; NCEL-CR-84.033) Avail: NTIS HC A04/MF A01 CSCL 13/13

The purpose of this report was to adapt earlier work in nonlinear shell-element methodology to the specific kinds of problems encountered in the analysis of critically-loaded reinforced concrete shell structures. The Continuum-Based nonlinear shell-element formulation for this shells was extended to thicker, layer-model types of shell structures. A resultant-type form of the basic equations was developed that is both appropriate for the treatment of thick, layered shells and leads to an efficient finite-element implementation as well. By eliminating most of the work associated with thickness integration, this approach should be effective when numerous layers and/or thickness integration points are required, as in the case of inelastically responding reinforced concrete. Pointwise constitutive relations for accurate through-thickness stress calculations are still employed though these are ultimately presented in the element computational routines in the form of resultants. GRA

N85-16210# Naval Research Lab., Washington, D. C. Geophysical and Plasma Dynamics Branch.
THERMAL EVAPORATION IN BLAST WAVES: A MODEL FOR ANEURISM FORMATION IN THE NRL (NAVAL RESEARCH LABORATORY) LASER-HANE SIMULATION EXPERIMENT Interim Report, Oct. 1983 - Oct. 1984
J. L. Giuliani, Jr. 11 Oct. 1984 38 p Sponsored in part by Defense Nuclear Agency
(AD-A147006; NRL-MR-5420) Avail: NTIS HC A03/MF A01 CSCL 19/4

A model for the development of the pronounced aneurism observed in the NRL LASER-HANE simulation experiment is presented. The model calculates the evaporative mass loss rate off the swept-up blast wave shell due to a thermal conduction front between the shell and the hot interior cavity. This front is limited to the segment of the shell where the self-generated magnetic fields are small. The thin-shell approximation is used to follow the nonlinear dynamics of the conductive and insulated segments, each of which is taken to be part of a spherical surface. The evaporating segment accelerates relative to the remaining part due to the decrease in its total mass and a rocket-like effect. For reasonable parameters the calculated time scale for appearance of the aneurism agrees with the experimental observations. Several suggestions are made for the future experiments to test the present model. GRA

N85-16211# Houston Univ., Tex. Dept. of Mechanical Engineering.
NONDESTRUCTIVE MEASUREMENT OF BULK RESIDUAL STRESSES Final Report, Jul. 1982 - Sep. 1984
K. Salama Oct. 1984 48 p
(Contract N00014-82-K-0496)
(AD-A147063) Avail: NTIS HC A03/MF A01 CSCL 20/11

This report states the objectives and the accomplishments of the research program performed to develop the method of the temperature dependence of ultrasonic velocity to determine residual stresses. The report comprises of four papers which contain the results obtained and the discussions made on these results. The papers also include the theoretical calculations obtained in support of the experimental work. Residual stresses are those contained in a body which has no external traction or other sources of stress, such as thermal gradients or body forces. When the body is externally loaded, these stresses are called internal stresses, and, accordingly, residual stresses may be considered as a special case for vanishing external loads. Residual stresses result from non-uniform plastic deformation which includes cold working, forming, forging, heat treatment, etc. Their presence in manufactured components plays an important role in determining the behavior of the component when it is subjected to service loads and environment. The residual stress distribution directly affects the growth rate and frequency of formation of stress induced cracks in steels. GRA

N85-16212# New Mexico Univ., Albuquerque.
A GENERAL THEORY OF CIRCUIT ANALOGY IN FRACTURE DIAGNOSIS Interim Report, 15 Feb. 1983 - 15 Feb. 1984
M. Akgun, F. D. Ju, and T. L. Paez Mar. 1984 77 p
(Grant AF-AFOSR-0086-81)
(AD-A147177; ME124(84)AFOSR-993-1; AFOSR-84-0910TR) Avail: NTIS HC A05/MF A01 CSCL 14/2

The present report develops electrical analogs to investigate multiple cracks on simple beams and more complex frame structures. Analog networks provide the economic tool to analyze such structures. The effect of multiple cracks on the natural frequencies of simple structures is studied in detail. It is shown that closely spaced multiple cracks are indistinguishable from an effective single crack. A severe crack on a structure can be identified if there are only minor cracks in addition to the major one. If, on the other hand, there is more than one severe crack, then the damage cannot, in general, be diagnosed with only three frequencies measurable. Nevertheless, a minimum number of cracks which are likely to be present in the structure can be established. Characteristic equations are developed in the form of linear systems for cantilever beam and general frame structures with multiple cracks. Usefulness of relative-frequency-change curves are demonstrated and rough guidelines are provided to aid the damage diagnosis process. Several numerical examples are included which illustrate the effect of multiple cracks on frequencies. Author (GRA)

N85-16213# Anamet Labs., Inc., San Carlos, Calif. Applied Mechanics Div.
A REVIEW OF IMPERFECTION SENSITIVITY OF STIFFENED SHELLS Interim Report, Dec. 1982 - Nov. 1983
R. L. Citerley Wright-Patteson AFB, Ohio AFWAL Feb. 1984 113 p
(Contract F33615-81-C-3201)
(AD-A147311; ANAMET-ASIAC-1183.1A; AFWAL-TR-84-3006) Avail: NTIS HC A06/MF A01 CSCL 13/13

A short history is related about how imperfections (i.e., deviations from the assumed theoretical form of a shell structure) came to be regarded as the major contributor to the experimental scatter observed in shell buckling tests, and the discrepancy between experimentally determined buckling loads and those determined by classical linear theory. J.M.T. Thompson's insight into the relationship between imperfection sensitivity and optimality of shell structures with respect to load configurations is brought out. The significant contributions to understanding elastic post-buckling behavior of thin stiffened shells and how this work relates to imperfection sensitivity are reviewed. The implications of this work and its applicability to current engineering design and analysis are assessed. The effects of geometric imperfections as well as those induced by boundary conditions or multiple load cases on the postbuckling behavior of shells are discussed. Added discussions by Profs. Singer and van Neut are also presented. Author (GRA)

N85-16214# Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
A HYDROGEN PARTITIONING MODEL FOR HYDROGEN ASSISTED CRACK GROWTH
M. Gao and R. P. Wei Sep. 1984 5 p
(Contract N00014-83-K-0107)

(AD-A147385; IFSM-84-127; TR-17) Avail: NTIS HC A02/MF A01 CSCL 20/11

A hydrogen partitioning model has been developed to account for the pressure and temperature dependence for hydrogen-assisted crack growth. The model gives explicit recognition to the role of hydrogen-microstructure interactions in determining the distribution (or partitioning) of hydrogen among the various microstructural elements (principally between the prior-austenite grain boundaries and the matrix) and the rate of crack growth along the elements. It also takes into account the role of various rate controlling processes in determining the rate that hydrogen is being supplied to the fracture process (or embrittlement) zone. Quantitative assessment of the model indicates very good agreements between the model predictions and the observed crack growth responses for AISI 4340 and 4130 steels tested in hydrogen and for AISI 4340 steel tested in hydrogen sulfide. This model accurately characterizes the reduction in crack growth rate and the concomitant change in fracture mode at high temperatures. Through its integration with the earlier models, based on rate controlling processes, the model predicts the pressure and temperature dependence for K-independent crack growth over the entire range of environmental conditions. GRA

N85-16215# Drexel Univ., Philadelphia, Pa.
IN-SITU STRESS DETERMINATION IN SOIL AND ROCK USING THE ACOUSTIC EMISSION METHOD Final Report
A. E. Lord, Jr. and R. M. Koerner 21 Sep. 1984 10 p
(Contract DAAG29-82-K-0037)
(AD-A147459; ARO-18687.6-GS) Avail: NTIS HC A02/MF A01 CSCL 08/7

A project was undertaken to determine how well acoustic emission (AE) techniques could be used to determine the existing stress state in rock and soil masses. It was found in rock that the Kaiser Effect (No AE until previous stress level EXCEEDED) was obeyed for short times (delay times) after stress application, but was not obeyed for delay times longer than about 100-1000 hours. In soil, the Kaiser effect was obeyed, but the effect of delay times was not investigated. These results apply to a very wide variety of rock and soil types. A Goodman rock jack was retrofitted with an AE transducer assembly and field tested in large discrete rock masses at a rock quarry and in bore holes in six different sites with varying rock types. This acoustic-rock jack functioned very well above and below the water table. The existing horizontal stresses, predicted from breaks in the AE versus applied stress curves, were of the same order (on the higher end) as those determined by more conventional methods of determining the existing stress state. A Menard pressuremeter was retrofitted with an AE transducer assembly, and used in bore holes in the field in various soil types. Preliminary field work has shown this acoustic pressuremeter to work well to depths of 10 feet (only used above the water table so far). The existing horizontal (lateral) stresses predicted from the AE pressuremeter results were in the higher portion of the expected values. GRA

N85-16216# Ballistic Research Labs., Aberdeen Proving Ground, Md.
NONLINEAR WAVES IN A ROD. RESULTS FOR INCOMPRESSIBLE ELASTIC MATERIALS
T. W. Wright Oct. 1984 33 p
(DA Proj. 1L1-61101-AH-43)
(AD-A147485; AD-F300491; BRL-MR-3390) Avail: NTIS HC A03/MF A01 CSCL 20/11

A nonlinear intrinsic theory is used to describe the motions of a straight round elastic rod including the influence of radial shear and inertia. Consideration of steady wave motions reduces the two coupled partial differential equations to ordinary differential equations for which two integrals of the motion may be found. For incompressible elastic materials with the restriction of small strain gradients, but arbitrary finite strains, a large variety of exact solutions may be found by quadrature. These include large amplitude periodic waves (which may contain shocks), solitary waves, and in some cases waves that are transitional from one stress level to another. Such solutions may be found for uniform stress/strain curves that are concave up or down, that contain inflections, and even curves that represent phase transitions. GRA

N85-16217# Michigan Univ., Ann Arbor.
NEW ASPECTS OF THERMOELASTIC CONTACT Final Report, 1 Oct. 1981 - 30 Sep. 1984
M. Comninou and J. R. Barber Oct. 1984 8 p
(Contract DAAG29-82-K-0001)
(AD-A147554; ARO-17907.12-EG) Avail: NTIS HC A02/MF A01 CSCL 20/11

This project has been concerned with a variety of problems in contact and fracture where the configuration of the system and hence the correct formulation of the problem - is influenced by thermoelastic distortion. A general result has also been established, relating the thermally induced curvature of a finite cylinder to the local heat flux across its end faces. This is of direct application in assessing the influence of thermal strain on the contact of two finite cylinders - a geometry commonly used for measurement of thermal contact resistance. Keywords include: heat conduction. GRA

N85-16218# Bundesanstalt fuer Materialpruefung, Berlin (West Germany).
COMPARATIVE INVESTIGATION OF TESTING METHODS TO DETERMINE HOT CRACK SUSCEPTIBILITY DURING WELDING Final Report [VERGLEICHSUNTERSUCHUNGEN AN PRUEFVERFAHREN ZUR ERMITTLUNG DER HEISSRISSANFAELLIGKEIT BEIM SCHWEISSEN]
K. Wilken 24 Feb. 1983 74 p refs In GERMAN
(BAM-ERP-2415) Avail: NTIS HC A04/MF A01

Hot cracking was investigated on a number of base metals and welding addition materials with several testing methods. The different types of sample forms (double fillet, cylindrical, annular tee-slot, and annular segment) are described. Test results are difficult to compare. The test results with the base metals St E 460 N, rail steel, X6 Cr Ni 18 11, X6 Cr Ni Mo 17 13, and Ni Cr 55 22 Co 12 Mo (Inconel 617) are given for the self-and separate-loading test methods. The technical, scientific, and economic significance of the results is discussed. Author (ESA)

N85-16219# Fraunhofer-Inst. fuer Betriebsfestigkeit, Darmstadt (West Germany).
THE INFLUENCE OF FASTENER FLEXIBILITY ON LOAD TRANSFER AND FATIGUE LIFE PREDICTIONS FOR MULTIROW BOLTED AND RIVETED JOINTS
H. Huth 1984 147 p refs In GERMAN; ENGLISH summary
(LBF-FB-172/84; ISSN-0721-5320) Avail: NTIS HC A07/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 90

A universal formula to calculate fastener flexibility was derived from load deformation measurements performed with a variety of commonly used types of single and double shear joints under quasi-static and flight-by-flight loading conditions. The improved accuracy of load transfer calculations is proved by comparative load transfer measurements with multirow joints. Load transfer mechanisms, especially under cyclic loading, are demonstrated, suggesting that fatigue life predictions based on local strains cannot be successful. A method for fatigue life estimation of multirow joints with shear-loaded fasteners is proposed. Author (ESA)

N85-16220# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany). Abteilung Betriebsnahe Ermuedungsfestigkeit.
INFLUENCE OF CONSTANT AMPLITUDE AND VARIABLE AMPLITUDE LOADING ON CRACK INITIATION AND MICRO CRACK PROPAGATION IN Al 2024-T3 Ph.D. Thesis - Hamburg Univ.
Joachim Foth Jul. 1984 131 p refs In GERMAN; ENGLISH summary Translation is in process as (ESA-TT-900)
(DFVLR-FB-84-29) Avail: NTIS HC A07/MF A01

Microcrack initiation and crack propagation of Al 2024-T3 notched and unnotched specimens were studied. For the evaluation of the propagation behavior of the microcracks, a fracture

mechanics based concept which takes into account the crack geometry and the stress distribution along the net sections of the specimens is presented. The observed load sequence effects under variable amplitude loading histories are predominantly influenced by the crack opening behavior. Author (ESA)

N85-16221# Kernforschungsanlage, Juelich (West Germany). Inst. fuer Reaktorwerkstoffe.
THE EFFECT OF THE TEST ATMOSPHERE ON THE FORMATION AND PROPAGATION OF CREEP CRACKS IN COMMERCIAL HIGH TEMPERATURE ALLOYS Thesis - Technische Hochschule, Aachen
H. M. Yun, H. Schuster, P. J. Ennis, and H. Nickel Jul. 1984 199 p refs In GERMAN; ENGLISH summary
(JUEL-1939; D-82; ISSN-0366-0885) Avail: NTIS HC A09/MF A01

The influence of surface cracks caused by corrosion on the creep rupture strength properties of Incoloy 800 H and Inconel 617 was investigated for temperatures between 1073 and 1223 K. The test environments were air and impure helium simulating the primary coolant gas of a high temperature reactor. It is shown that the surface cracks lead to an increased creep rate at creep strains > 5%; the increases are similar in both atmospheres. Rupture of the specimen occurs when surface cracks and voids develop inside the specimen due to creep damage processes. A method to plot the depth of surface cracks caused by corrosion with the stress-rupture curves was developed. In this type of diagram the damage resulting from surface cracks can be related to the creep rupture data, indicating whether corrosion effects need to be considered in the derivation of design stresses.
Author (ESA)

N85-16222# Technische Hochschule, Aachen (West Germany). Lehrstuhl fuer Messtechnik.
MEASUREMENT AND EVALUATION OF THE LOADING OF SHAFTS BY TORSIONAL VIBRATIONS Final Report [DAS MESSEN UND BEWERTEN DER BEANSPRUCHUNG VON WELLEN DURCH TORSIONSSCHWINGUNGEN]
Jiri Sobota 10 Jan. 1983 28 p refs In GERMAN
Avail: NTIS HC A03/MF A01

Measuring possibilites for the loading of shafts by torsional vibrations were investigated, emphasizing rotary-elastic couplings. An equivalent drive system with an asynchronous motor was used. The determination of coupling and air gap moments is described. The investigations give the static coupling characteristics, the dynamic behavior of the drive, the coupling moment, and the air gap moment. Author (ESA)

N85-15671# British Aerospace Aircraft Group, Stockport (England). Structures Dept.
ADVANCED FATIGUE MONITORING ON SERVICE AIRCRAFT
A. Walkden *In* AGARD Operational Loads Data Aug. 1984 16 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15672# British Aerospace Aircraft Group, Preston (England).
EXPERIENCES OBTAINED FROM SERVICE FATIGUE MONITORING EXERCISES
A. P. Ward *In* AGARD Operational Loads Data Aug. 1984 16 p refs (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

N85-15680# British Aerospace Aircraft Group, Preston (England).
TORNADO: STRUCTURAL USAGE MONITORING SYSTEM (SUMS)
A. P. Ward *In* AGARD Operational Loads Data Aug. 1984 13 p refs (For primary document see N85-15664 07-01)
Avail: NTIS HC A14/MF A01

N85-15681# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
KEEPING UP WITH OPERATIONAL LOADS IN THE FRENCH AIR FORCE: DEFINING NEW EQUIPMENT [SUIVI DES CHARGES EN SERVICE DANS L'ARMEE DE L'AIR FRANCAISE DEFINITION D'UN NOUVEAU MATERIEL]
L. Baranes and J. P. Cornand *In its* Operational Loads Data Aug. 1984 12 p In FRENCH (For primary document see N85-15664 07-01)
Copyright. Avail: NTIS HC A14/MF A01

42 GEOSCIENCES (GENERAL)

N85-16223# Joint Publications Research Service, Arlington, Va.
USSR REPORT: EARTH SCIENCES
13 Dec. 1984 118 p refs Transl. into ENGLISH from various Russian articles
(JPRS-UES-84-008) Avail: NTIS HC A06

New items, abstracts and scientific reports on aspects of earth sciences including meteorology, oceanography, terrestrial geophysics, atmospheric physics, and arctic and antarctic research are described. For individual titles, see N85-16224 through N85-16240.

N85-16224# Joint Publications Research Service, Arlington, Va.
AUTOMATED LAVINA COLLECTS DATA ON SNOW c43
A. Muratov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 1-2 Transl. into ENGLISH from Izv. (Moscow), Aug. 1984 p 6 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

On the slopes of the southwestern Tien Shan Mountains, the Lavina automated complex, whose main function is to gather data for use in avalanche forecasting, was tested. The 250 gauges provide information regarding snow parameters. This data is fed into the computer, which then issues a forecast. B.G.

N85-16225# Joint Publications Research Service, Arlington, Va.
VITYAZ SPECIALISTS STUDY HUMAN ADAPTABILITY TO OCEAN DEPTHS c52
A. Androshin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 6-8 Transl. into ENGLISH from Pravda (Moscow), 27 Sep. 1984 p 6 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

The deep water dives of Soviet aquanauts to the summit of Mount Josephine (200 m), located 400 miles west of Gibraltar are described. The procedures from pressure chamber to decompression are briefly explained. B.G.

N85-16226# Joint Publications Research Service, Arlington, Va.
MARITIME PROSPECTING, MINING DISCUSSED c43
Yu. B. Kazmin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 9-13 Transl. into ENGLISH from Razvedk. i Okhr. Nedr (Moscow), no. 7, Jul. 1984 p 57-60 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

The world's oceans play an important role as a source of energy and mineral resources. Underwater deposits produce more than 20 percent of the oil output of capitalist and developing countries and this share is steadily growing. Maritime and coastal deposits of tin, gold, diamonds and also titanium also have practical significance. The prospects for mining ferromanganesian nodules, a complex ore with nickel, cobalt, copper and manganese, in deep water regions of the sea bed have become realistic. Policies governing international use of the ocean bottom are discussed.
B.G.

N85-16227# Joint Publications Research Service, Arlington, Va.
EXPLORING OCEAN'S MINERAL WEALTH c48
A. S. Monin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 14-17 Transl. into ENGLISH from Nedelya (Moscow), no. 33, 13-19 Aug. 1984 p 7 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

Mining of iron manganese nodules from the ocean floor is

discussed. Hypotheses for the distribution and development are presented. B.G.

N85-16228# Joint Publications Research Service, Arlington, Va.
HYDROLOGIC CHARACTERISTICS OF THE MEDITERRANEAN AND BLACK SEA c48
M. G. Perov, Yu. S. Kalashnikova, N. Ya. Kuklina, and I. F. Lukashin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 25-33 refs Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 4, Apr. 1984 p 79-84 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

Space time variability of hydrologic characteristics of the test areas on a microscale and mesoscale, as well as background parameter data on the selected areas of the Mediterranean were studied in order to understand the radiochemical behavior of specific radionuclides in the process of transport and diffusion of a passive admixture in the sea medium. Measurements of the hydrologic characteristics of vertical distribution of the stratified structure of hydrophysical fields on a microscale were accomplished with the aid of a high speed sensing package. R.J.F.

N85-16229# Joint Publications Research Service, Arlington, Va.
RAZREZY PROGRAM RESEARCH IN THE TROPICAL ATLANTIC c47
B. O. Nelepo and V. V. Yefimov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 34-42 refs Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 4, Apr. 1984 p 13-19 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

The processes of accumulation and transport of heat in the energy active tropical region of the Atlantic Ocean is discussed. The theoretical and experimental aspects of the overall program are presented. Investigations in the energy active tropical zone are integrated within the framework of the heat budget subprogram, the principal task of which consists in elucidating the physical mechanisms of formation of the average south-north heat flow across the equator in the Atlantic Ocean and its possible anomalies. The equatorial region of the Atlantic Ocean differs substantially from analogous regions in the Pacific and Indian Oceans. A total average annual quantity of heat is transported across the Atlantic Ocean from south to north which equals (100 to 130) x 1013 w. This is a substantial quantity, and therefore anomalies in this transport can significantly affect weather formation in Europe, especially in the European part of the U.S.S.R. R.J.F.

N85-16230# Joint Publications Research Service, Arlington, Va.
KHIBINY EXPERIMENT DESCRIBED c46
Ye. P. Velikhov, A. A. Zhamaletdinov, and M. S. Zhdanov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 44-53 Transl. into ENGLISH from Zemlya i Vselennaya (Moscow), no. 5, Sep. - Oct. 1984 p 12-19 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

On the Kola Peninsula a power pulsed magnethodynamic generator is being used in probing for up to tens of kilometers into the depths of an enormous territory. This experiment encompasses an experimental test area where tests of new equipment and the new technology of deep electromagnetic soundings are being carried out. In the arsenal of geophysical methods for studying the Earth's deep layers, in addition to seismic and gravimetric methods, an important place is occupied by electromagnetic methods. The essence of these methods is that the primary (external) electromagnetic field induces electrical currents in the earth's conducting layers which generate a secondary (internal) field. Special sensors at the surface register the total effect of these two fields. The electrical currents induced in the Earth, and accordingly, the secondary field, are dependent on the distribution of conductivity in the Earth. Thus, on the basis of electromagnetic measurements at the Earth's surface it is possible to determine conductivity in the Earth's deep layers and it can give information on the thermodynamic and phase states of rocks at great depths. The apparatus and results of the geophysical probes are discussed. R.J.F.

N85-16231# Joint Publications Research Service, Arlington, Va.
MICROSEISM LEVEL, TIME VARIATIONS AT TURKMEN SEISMIC STATIONS STUDIED c46
B. S. Karryyev *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 71-76 refs Transl. into ENGLISH from Izv. Akad. Nauk Turkm. SSR: Ser. Fiz.-Tekh. Khim. i Geol. Nauk (Ashkhabad, USSR), no. 1, 1984 p 77-81 (For primary document see N85-16223 07-42)
Avail: NTIS HC 06

Time variations in the microseismic background at the Turkmen seismic station are discussed. The variations were found to have an thropogenic origins. The influence of ground conditions on the amplitude-perio characteristics of the microseisms was assessed. A method is proposed for studying the average spectra of the microseismic background. A map was obtained showing the distribution of the maximum microseisms at the regional seismic stations. R.J.F.

N85-16232# Joint Publications Research Service, Arlington, Va.
GENERAL MODEL OF EARTHQUAKES AND THE PLACE OF WARNINGS IN IT c46
O. A. Odekov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 77-85 refs Transl. into ENGLISH from Izv. Akad. Nauk Turkm. SSR: Ser. Fiz.-Tekh. Khim. i Geol. Nauk (Ashkhabad, USSR), no. 1 1984 p 64-70 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

A general model for the prediction of earthquakes is discussed. The model is based on seismic generating tectonic movements. The place of traditional warning signs is discussed. It is claimed that this method of earthquake forecasting is universal in terms of time, force, and location. R.J.F.

N85-16233# Joint Publications Research Service, Arlington, Va.
EARTHQUAKE FORECASTING RESEARCH IN THE UKRAINE c46
V. V. Kutas and G. Ye. Kharechko *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 87-90 Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 2, Feb. 1984 p 105-107 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

Research relative to earthquake prediction in the Ukraine is discussed. Deep lithospheric structure, anomalous changes in geomagnetic fields in the Carpathian Mountains, fracture zones, the stress-strained state of mountain mass rock, and mathematical models are discussed. R.J.F.

N85-16234# Joint Publications Research Service, Arlington, Va.
NEW DATA ON PRESENCE OF ORES IN SALT DOME STRUCTURES OF DNIEPER-DONETS BASIN Abstract Only c43
B. V. Kolishniy *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 91 Transl. into ENGLISH from Dokl.. Akad. Nauk Ukr. SSR, Ser. B: Geol. Khim. i Biol. Nauk. (Kiev), no. 9, Sep. 1984 p 3-5 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

There are more than 300 salt domes in the Dnieper-Donets basin of the USSR. In approximately 1/10 of them hydrothermal mineralization of different types, such a mercury, lead-zinc, and barite has been discovered. More than half of these ore shows have been found in the southeastern part of the basin. Data on the ore content of salt domes in the central part of the region obtained in recent mineralogical-geochemical investigations are given. The vast majority of salt dome structures containing ores are found in a broad zone of a deep fault extending through the entire axial part of the basin. For this reason there is a whole series of salt dome structures in this zone which warrant careful exploration. The salt domes of the greater practical importance are those in which the cap rocks, hypothetically the ore-bearing zones, are situated at relatively shallow depths. R.S.F.

N85-16235# Joint Publications Research Service, Arlington, Va.
DEEP STRUCTURE OF WESTERN SIBERIA Abstract Only **c46**
Ye. V. Karus, G. A. Gabrielyants, V. M. Kovylin, and N. M. Chernyshev *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 92 Transl. into ENGLISH from Sov. Geol. (Moscow), no. 5, May 1984 p 75-85 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

Data from seismogeological sections for clarifying the morphological characteristics of the principal discontinuities in the Earth's crust in western Siberia are summarized. Two principal discontinuities exist: the Mohorovicic discontinuity (Moho) and consolidated crust (CC). The Moho is at depths of 34 to 50 km, characterized by boundary velocities 7.9 to 8.7 km/sec. The CC is at depths 4 to 10 km with boundary velocities 6 to 6.6 km/sec. The position of the CC boundary, like the Moho, is not constant; the amplitude of their depths is up to 3 km. In the morphology of the Moho and CC discontinuities there is a rigorous vertical zonality; uplifted or subsided blocks at the Moho correspond to approximately the same blocks at the CC discontinuity, but with reverse representation in the relief. About 80 percent of the petroleum, gas, and as condensate deposits occur in the central region which has specific characteristics in comparison with other parts of the platform. R.S.F.

N85-16236# Joint Publications Research Service, Arlington, Va.
MODEL OF EARTHQUAKE MECHANISM Abstract Only **c46**
A. I. Dobrolyubov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 92-93 Transl. into Akad Nauk BSSR (Minsk), v. 28, no. 6, Jun. 1984 p 550-553 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

The tectonic mechanism outlined in an earlier study was investigated using a laboratory model simulating discrete wave movement of a layer of a deformable body under the influence of a traveling deformation wave and periodic displacements of parts of a body when there are elastic couplings to a support. The earlier study gave what appeared to be a clear picture of the fundamental physical aspects of the mechanism of accumulation and release of shearing stresses and discrete movements of crustal blocks. For example, the model simulates the genesis of horizontal movements of a layer of an elastic body, the gradual accumulation of elastic energy, the process of periodic displacements (jumps) of elastic layers coupled by mechanical cohesion and frictional forces to a supporting surface, the influence of the physico-mechanical properties of rock movements during their cohesion with the underlying surface, and the magnitude of rock movements during earthquakes. It becomes clear that an earthquake is a jumplike process of return of terrestrial rocks to their normal state after a prolonged period of stresses. R.S.F.

N85-16237# Joint Publications Research Service, Arlington, Va.
STATISTICAL FILTERING AS METHOD FOR DETECTING TRANSCRUSTAL ACOUSTIC ANOMALIES Abstract Only **c46**
Yu. P. Orovetskiy and L. M. Yavlochkina *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 93-94 Transl. into ENGLISH from Dokl. Akad. Nauk Ukr. SSR, Ser. B: Geol. Khim. i Biol. Nauk. (Kiev), no. 4, Apr. 1984 p 17-20 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

Transcrustal acoustic anomalies were first discovered in the area of the Ukrainian shield. These are regions with an enhanced capability for generation of exchange waves or sectors where reflecting elements are seldom registered. These anomalies have the form of a funnel or overturned truncated cone. They can be traced to a depth of 70 km and can be extrapolated to a depth of 120 km. These regions emerge from the upper mantle, intersecting the entire thickness of the crust. At the top their width is 70 to 160 km and the base 20 to 80 km. The basis for discriminating transcrustal acoustic anomalies is the nonuniformity in the spatial distribution of both exchange points and reflecting elements within the limits of different geological structures. In order to make these inhomogeneities stand out it is necessary to eliminate the regional background. A statistical filtering method is proposed for accomplishing this. The practical application of the method is described. R.S.F.

N85-16238# Joint Publications Research Service, Arlington, Va.
INTERPRETING GEOTHERMAL ANOMALIES BY SPECIAL POINTS METHOD Abstract Only **c43**
R. I. Kutas and V. A. Tsvyashchenko *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 94 Transl. into ENGLISH from Dokl. Akad. Nauk Ukr. SSSR, Ser. B: Geol. Khim. i Biol. Nauk. (Kiev), no. 4, Apr. 1984 p 13-16 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

The interpretation of heat flow anomalies is usually accomplished by constructing a theoretical curve which is as close as possible to the observed curve. This is an imprecise, time-consuming procedure. An alternative approach is described involving the discrimination of special points which are then used in determining the parameters of the disturbing object. The method as developed herein uses as an illustration a nonstationary heat flow field of a cooling, infinitely elongated prism. The horizontal derivative of the heat flow is found and the coordinate of its maximum is determined. With this as a point of departure it is shown how nomograms can be constructed on the basis of the heat flow anomaly for rapid determination of the horizontal extent L and time of onset of cooling of the infinite prism in the entire range of tau and L. R.S.F.

N85-16239# Joint Publications Research Service, Arlington, Va.
SATELLITE PHOTOGRAPHS SUGGEST ARCTIC VOLCANO **c43**
Yu. Masurenkov and O. Dzyuba *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 99-100 Transl. into ENGLISH from Izv. (Moscow), 31 May 1984 p 6 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

Satellite photographs have registered a foggy trail over the Arctic Ocean on several occasions. The activities of a Soviet expedition to Bennett Island in the Arctic are described briefly. Evidence of volcanic activity on the island and on the ocean bottom around it is discussed. The foggy trail above the sea that a satellite could sense is attributed to the action of lava from a volcano. R.S.F.

N85-16240# Joint Publications Research Service, Arlington, Va.
PARACHUTE EXPEDITION TO ARCTIC **c02**
N. Selivanor *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 106-108 Transl. into ENGLISH from Daily Rev. (Moscow), v. 30, no. 131, 29 Jun. 1984 p 1-4 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

The technique of parachuting people and heavy cargo onto an ice floe in the Arctic is described. The challenges of establishing a floating research facility are discussed. Particular emphasis is placed upon runway construction which permits heavy aircraft to land and deliver essential supplies. R.S.F.

43 EARTH RESOURCES

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see *35 Instrumentation and Photography.*

N85-16241*# Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
VARIATION IN SPECTRAL RESPONSE OF SOYBEANS WITH RESPECT TO ILLUMINATION, VIEW, AND CANOPY GEOMETRY
K. Jon Ranson, Larry L. Biehl, and Marvin E. Bauer (Minnesota Univ.) 31 Jul. 1984 27 p refs ERTS

(Contract NAS9-16528)
(E85-10040; NASA-CR-171821; NAS 1.26:171821;
LARS-TR-073184) Avail: NTIS HC A03/MF A01 CSCL 02C

Comparisons of the spectral response for incomplete (well-defined row structure) and complete (overlapping row structure) canopies of soybeans indicated a greater dependence on Sun and view geometry for the incomplete canopies. Red and near-IR reflectance for the incomplete canopy decreased as solar zenith angle increased for a nadir view angle until the soil between the plant rows was completely shaded. Thereafter for increasing solar zenith angle, the red reflectance leveled off and the near-IR reflectance increased. A 'hot spot' effect was evident for the red and near-IR reflectance factors. The 'hot spot' effect was more pronounced for the red band based on relative reflectance value changes. The ratios of off-nadir to nadir acquired data reveal that off-nadir red band reflectance factors more closely approximated straightdown measurements for time periods away from solar noon. Normalized difference generally approximated straightdown measurements during the middle portion of the day. R.S.F.

N85-16242*# Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
SPECTRAL ESTIMATORS OF ABSORBED PHOTOSYNTHETICALLY ACTIVE RADIATION IN CORN CANOPIES
K. P. Gallo, C. S. T. Daughtry, and Marvin E. Bauer (Minnesota Univ.) 29 Jun. 1984 20 p refs ERTS
(Contract NAS9-16528)
(E85-10041; NASA-CR-171822; NAS 1.26:171822;
LARS-TR-062984) Avail: NTIS HC A02/MF A01 CSCL 02C

Most models of crop growth and yield require an estimate of canopy leaf area index (LAI) or absorption of radiation. Relationships between photosynthetically active radiation (PAR) absorbed by corn canopies and the spectral reflectance of the canopies were investigated. Reflectance factor data were acquired with a LANDSAT MSS band radiometer. From planting to silking, the three spectrally predicted vegetation indices examined were associated with more than 95% of the variability in absorbed PAR. The relationships developed between absorbed PAR and the three indices were evaluated with reflectance factor data acquired from corn canopies planted in 1979 through 1982. Seasonal cumulations of measured LAI and each of the three indices were associated with greater than 50% of the variation in final grain yields from the test years. Seasonal cumulations of daily absorbed PAR were associated with up to 73% of the variation in final grain yields. Absorbed PAR, cumulated through the growing season, is a better indicator of yield than cumulated leaf area index. Absorbed PAR may be estimated reliably from spectral reflectance data of crop canopies. R.S.F.

N85-16243*# Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
CHANGES IN SPECTRAL PROPERTIES OF DETACHED LEAVES
C. S. T. Daughtry and L. L. Biehl 15 Jun. 1984 24 p refs ERTS
(Contract NAS9-16528)
(E85-10042; NASA-CR-171818; NAS 1.26:171818;
LARS-TR-061584) Avail: NTIS HC A02/MF A01 CSCL 05B

If leaf senescence can be delayed for several days without significant changes in spectral properties, then samples of leaves at remote test sites could be prepared and shipped to laboratories to measure spectral properties. The changes in spectral properties of detached leaves were determined. Leaves from red birch and red pine were immersed in water or 0.001 M benzylaminopurine (BAP) and stored in plastic bags in the dark at either 5 or 25 C. Total directional-hemispherical reflectance and transmittance of the adaxial surface of birch leaves were measured over the 400 to 1100 nm wavelength region with a spectroradiometer and integrating sphere. Pine needles were taped together and reflectance of the mat of needles was measured. Spectral properties changed less than 5% of initial values during the first week when leaves were stored at 5 C. Storage at 25 C promoted rapid senescence and large changes in spectral properties. BAP delayed, but did not stop, senescence at 25 C. R.S.F.

N85-16244*# SAR, Inc., Riverdale, Md.
CHARACTERIZING THE SCIENTIFIC POTENTIAL OF SATELLITE SENSORS
Dec. 1984 13 p ERTS
(Contract NAS5-28200)
(E85-10044; NASA-CR-174221; NAS 1.26:174221) Avail: NTIS HC A02/MF A01 CSCL 08B

Eleven thematic mapper (TM) radiometric calibration programs were tested and evaluated in support of the task to characterize the potential of LANDSAT TM digital imagery for scientific investigations in the Earth sciences and terrestrial physics. Three software errors related to integer overflow, divide by zero, and nonexist file group were found and solved. Raw, calibrated, and corrected image groups that were created and stored on the Barker2 disk are enumerated. Black and white pixel print files were created for various subscenes of a San Francisco scene (ID 40392-18152). The development of linear regression software is discussed. The output of the software and its function are described. Future work in TM radiometric calibration, image processing, and software development is outlined. R.S.F.

N85-16245*# Utah Univ., Salt Lake City.
DETECTING AGRICULTURAL TO URBAN LAND USE CHANGE FROM MULTI-TEMPORAL MSS DIGITAL DATA
Merrill K. Ridd, John A. Merola, and Richard A. Jaynes [1983] 10 p refs ERTS
(Grant NAGw-95)
(E85-10049; NASA-CR-174225; NAS 1.26:174225) Avail: NTIS HC A02/MF A01 CSCL 05B

Conversion of agricultural land to a variety of urban uses is a major problem along the Wasatch Front, Utah. Although LANDSAT MSS data is a relatively coarse tool for discriminating categories of change in urban-size plots, its availability prompts a thorough test of its power to detect change. The procedures being applied to a test area in Salt Lake County, Utah, where the land conversion problem is acute are presented. The identity of land uses before and after conversion was determined and digital procedures for doing so were compared. Several algorithms were compared, utilizing both raw data and preprocessed data. Verification of results involved high quality color infrared photography and field observation. Two data sets were digitally registered, specific change categories internally identified in the software, results tabulated by computer, and change maps printed at 1:24,000 scale. R.S.F.

N85-16246*# Utah Univ., Salt Lake City. Center for Remote Sensing and Cartography.
AN INTEGRATED REMOTE SENSING APPROACH FOR IDENTIFYING ECOLOGICAL RANGE SITES
Richard A. Jaynes [1983] 10 p refs Sponsored in part by Utah Div. of State Lands and Forestry ERTS
(Grant NAGw-95)
(E85-10050; NASA-CR-174226; NAS 1.26:174226) Avail: NTIS HC A02/MF A01 CSCL 08B

A model approach for identifying ecological range sites was applied to high elevation sagebrush-dominated rangelands on Parker Mountain, in south-central Utah. The approach utilizes map information derived from both high altitude color infrared photography and LANDSAT digital data, integrated with soils, geological, and precipitation maps. Identification of the ecological range site for a given area requires an evaluation of all relevant environmental factors which combine to give that site the potential to produce characteristic types and amounts of vegetation. A table is presented which allows the user to determine ecological range site based upon an integrated use of the maps which were prepared. The advantages of identifying ecological range sites through an integrated photo interpretation/LANDSAT analysis are discussed.
Author

N85-16247*# National Aeronautics and Space Administration. Earth Resources Labs., Bay St. Louis, Miss.

RELATIONSHIP BETWEEN FOREST CLEARING AND BIOPHYSICAL FACTORS IN TROPICAL ENVIRONMENTS: IMPLICATIONS FOR THE DESIGN OF A FOREST CHANGE MONITORING APPROACH

Steven A. Sader and Armond T. Joyce Sep. 1984 25 p refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS

(E85-10051; NASA-TM-87405; NSTL/ERL-230; NAS 1.15:87405) Avail: NTIS HC A02/MF A01 CSCL 05B

The relationship between forest clearing, biophysical factors (e.g, ecological zones, slope gradient, soils), and transportation network in Costa Rica was analyzed. The location of forested areas at four reference datas (1940, 1950, 1961, and 1977) as derived from aerial photography and LANDSAT MSS data was digitilized and entered into a geographically-referenced data base. Ecological zones as protrayed by the Holdridge Life Zone Ecology System, and the location of roads and railways were also digitized from maps of the entire country as input to the data base. Information on slope gradient and soils was digitized from maps of a 21,000 square kilometer area. The total area of forest cleared over four decades are related to biophysical factors was analyzed within the data base and deforestation rates and trends were tabulated. The relatiohship between forest clearing and ecological zone and the influence of topography, sils, and transportation network are presented and discussed. R.S.F.

N85-16248*# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).

INTEGRATED ANALYSIS OF REMOTE SENSING PRODUCTS FROM BASIC GEOLOGICAL SURVEYS [ANALISE INTEGRADA DOS PRODUTOS DE SENSORIAMENTO REMOTO EM LEVANTAMENTOS GEOLOGICOS BASICOS]

Edgar daSilvaFagundesFilho, Principal Investigator Aug. 1984 12 p refs In PORTUGUESE; ENGLISH summary Presented at the 33rd Congr. Brasil. de Geol. Sponsored by NASA ERTS

(E85-10052; NASA-CR-174188; NAS 1.26:174188; INPE-3243-PRE/589) Avail: NTIS HC A02/MF A01 CSCL 05B

Recent advances in remote sensing led to the development of several techniques to obtain image information. These techniques as effective tools in geological mapping are analyzed. A strategy for optimizing the images in basic geological surveying is presented. It embraces as integrated analysis of spatial, spectral, and temporal data through photoptic (color additive viewer) and computer processing at different scales, allowing large areas survey in a fast, precise, and low cost manner. Author

N85-16249*# SAR, Inc., Riverdale, Md.

CHARACTERIZING THE SCIENTIFIC POTENTIAL OF SATELLITE SENSORS

Nov. 1984 13 p Sponsored by NASA Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS

(E85-10053; NASA-CR-174227; NAS 1.26:174227) Avail: NTIS HC A02/MF A01 CSCL 08B

Analytical and programming support is to be provided to characterize the potential of the LANDSAT thematic mapper (TM) digital imagery for scientific investigations in the Earth sciences and in terrestrial physics. In addition, technical support to define lower atmospheric and terrestrial surface experiments for the space station and technical support to the Research Optical Sensor (ROS) study scientist for advanced studies in remote sensing are to be provided. Eleven radiometric calibration and correction programs are described. Coherent noise and bright target saturation correction are discussed along with image processing on the LAS/VAX and Hp-300/IDIMS. An image of San Francisco, California from TM band 2 is presented. R.S.F

N85-16250*# Arizona Univ., Tucson.

LANDSAT-4 THEMATIC MAPPER MODULATION TRANSFER FUNCTION (MFT) EVALUATION Progress Report, 15 Jun. - 15 Sep. 1984

Robert Schowengerdt, Principal Investigator 16 Nov. 1984 8 p ERTS

(Contract NCC2-234)

(E85-10055; NASA-CR-174228; NAS 1.26:174228) Avail: NTIS HC A02/MF A01 CSCL 08B

The techniques used in the two-image comparison of TM data and 7-meter aerial data acquired over San Francisco on August 12, 1983 during LANDSAT 4 operation were refined. Analysis of one area is complete and reported herein; analysis of a second area is in progress. A large test target for measurement of the LANDSAT 5 MTF at the White Sands Missile Range, New Mexico was constructed. R.S.R.

N85-16251*# Texas A&M Univ., College Station. Dept. of Mathematics.

PROCEEDINGS OF THE SECOND ANNUAL SYMPOSIUM ON MATHEMATICAL PATTERN RECOGNITION AND IMAGE ANALYSIS PROGRAM Final Report, 16 Jul. 1983 - 15 Jul. 1984

L. F. Guseman, Jr., Principal Investigator 1984 595 p refs Symp. held in Houston, Tex., 6-8 Jun. 1984 Original contains imagery. Original phototgraphy may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS

(Contract NAS9-16664)

(E85-10056; NASA-CR-171819; NAS 1.26:171819) Avail: NTIS HC A25/MF A01 CSCL 12A

Several papers addressing image analysis and pattern recognition techniques for satellite imagery are presented. Texture classification, image rectification and registration, spatial parameter estimation, and surface fitting are discussed. For individual titles, see N85-16252 through N85-16267.

N85-16252*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

ESTIMATING LOCATION PARAMETERS IN A MIXTURE c64

R. P. Heydorn and M. V. Martin (Lockheed Engineering and Management Services Co., Inc.) *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 1-26 refs ERTS (For primary document see N85-16251 07-43)

Avail: NTIS HC A25/MF A01 CSCL 12A

The problem of estimating the parameters in a finite mixture is considered. The approach is based on an integral equation formulation of the form h sub t (x) = integral (limits b and a) f(x-y) g sut t (y)dy where h sub t is a smoothed version of h and g sub t is a prior function that tends to be concentrated on the translation values. A solution for g sub t that uses the method of regularization and one based on a posterior operator approach is considered. Numerical simulations are presented to bring out some of the estimation and numerical problems of these approaches. M.G.

N85-16253*# Rice Univ., Houston, Tex.

NONPARAMETRIC ANALYSIS OF MINNESOTA SPRUCE AND ASPEN TREE DATA AND LANDSAT DATA

David W. Scott and Rodney Jee *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 27-49 refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)

Avail: NTIS HC A25/MF A01 CSCL 12A

The application of nonparametric methods in data-intensive problems faced by NASA is described. The theoretical development of efficient multivariate density estimators and the novel use of color graphics workstations are reviewed. The use of nonparametric density estimates for data representation and for Bayesian classification are described and illustrated. Progress in building a data analysis system in a workstation environment is reviewed and preliminary runs presented. M.G.

N85-16254*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

TEXTURE CLASSIFICATION USING AUTOREGRESSIVE FILTERING c64

Wayne M. Lawton and Meemong Lee *In* Texas A and M Univ.

Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 51-99 refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

A general theory of image texture models is proposed and its applicability to the problem of scene segmentation using texture classification is discussed. An algorithm, based on half-plane autoregressive filtering, which optimally utilizes second order statistics to discriminate between texture classes represented by arbitrary wide sense stationary random fields is described. Empirical results of applying this algorithm to natural and sysnthesized scenes are presented and future research is outlined. Author

N85-16255*# Houston Univ., Tex. Dept. of Mathematics.
BAYESIAN ESTIMATION OF NORMAL MIXTURE PARAMETERS c65
Charles Peters *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 101-114 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

A Bayesian, or penalized maximum likelihood, approach to the problem of estimating the parameters of a mixture of multivariate normal distributions is proposed. The Bayesian formulation eliminates the problem of singularities in the likelihood function and results in an attractive EM-like procedure. Although the question of consistency is not settled, it is suggested that the proposed method has certain advantages over both the constrained and unconstrained maximum likelihood procedures. Author

N85-16256*# Texas Univ., Austin. Center for Statistical Sciences.
SPATIAL ESTIMATION FROM REMOTELY SENSED DATA VIA EMPIRICAL BAYES MODELS c65
Joe R. Hill, David V. Hinkley, Hubert Kostal, and Carl N. Morris *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 115-135 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

Multichannel satellite image data, available as LANDSAT imagery, are recorded as a multivariate time series (four channels, multiple passovers) in two spatial dimensions. The application of parametric empirical Bayes theory to classification of, and estimating the probability of, each crop type at each of a large number of pixels is considered. This theory involves both the probability distribution of imagery data, conditional on crop types, and the prior spatial distribution of crop types. For the latter Markov models indexed by estimable parameters are used. A broad outline of the general theory reveals several questions for further research. Some detailed results are given for the special case of two crop types when only a line transect is analyzed. Finally, the estimation of an underlying continuous process on the lattice is discussed which would be applicable to such quantities as crop yield. M.G.

N85-16257*# Texas A&M Univ., College Station. Center for Approximation Theory.
MULTIVARIATE SPLINE METHODS IN SURFACE FITTING c64
L. F. Guseman, Jr., Principal Investigator and L. L. Schumaker *In its* Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 137-163 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

The use of spline functions in the development of classification algorithms is examined. In particular, a method is formulated for producing spline approximations to bivariate density functions where the density function is decribed by a histogram of measurements. The resulting approximations are then incorporated into a Bayesiaan classification procedure for which the Bayes decision regions and the probability of misclassification is readily computed. Some preliminary numerical results are presented to illustrate the method. Author

N85-16258*# Texas A&M Univ., College Station.
AUTOREGRESSIVE SPECTRAL ESTIMATION FOR TWO DIMENSIONAL TIME SERIES c65
H. Joseph Newton and William B. Smith *In its* Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 165-174 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

The method of determining asymptotic confidence bands for autoregressive spectra due to Newton and Pagano is extended to the case of data observed in the plane. One Quadrant Autoregressive Models are used as a basis for the method. Author

N85-16259*# Southern Methodist Univ., Dallas, Tex. Dept. of Statistics.
EXPLORING THE USE OF STRUCTURAL MODELS TO IMPROVE REMOTE SENSING AGRICULTURAL ESTIMATES
Richard F. Gunst and Mani Y. Lakshminarayanan *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 175-203 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 02C

Satellite estimates of agricultural characteristics often are not sufficiently precise for reliable use in small geographical regions. The precision of estimates of agricultural characteristics such as crop proportions and leaf area indexes can be increased by modeling ground observations as a function of satellite estimates. Linear regression models using least squares estimators of the model parameters are most often advocated as an appropriate methodology; however, least squares estimation requires that the predictor variables are measured without error, an unreasonable assumption for this application. An alternative estimation methodology which assumes that both the response variables (ground observations) and the predictor variables (satellite estimates) are measured with error involves the use of linear structural models. The application of linear structural models to the estimation of agricultural characteristics using satellite spectral measurements is examined. Author

N85-16260*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CALIBRATION OR INVERSE REGRESSION: WHICH IS APPROPRIATE FOR CROP SURVEYS USING LANDSAT DATA?
R. S. Chhikara (Lockheed Engineering and Management Services Co., Inc., Houston, Tex.) and A. G. Houston *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 205-243 refs Sponsored in part by Dept. of Agriculture (For primary document see N85-16251 07-43)
(Contract NAS9-15800)
Avail: NTIS HC A25/MF A01 CSCL 02C

Calibration and inverse regression estimators of crop proportions are investigated where the auxiliary variable is obtained from binary classification of multivariate LANDSAT data. The appropriate model relating classifier proportions and ground observed proportions for a given crop type is the calibration model. Under this model the inverse regression estimator is superior to the calibration estimator in estimating the crop acreage or proportion for a region of interest. Author

N85-16261*# Maryland Univ., College Park. Center for Automation Research.
EVIDENCE ACCUMULATION FOR SPATIAL REASONING c64
Takashi Matsuyama, Vincent Shang-Shoug Hwang, and Larry S. Davis *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 245-302 refs Previously announced as N84-29302 Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)

Avail: NTIS HC A25/MF A01 CSCL 12A

The evidence accumulation process of an image understanding system is described enabling the system to perform top-down(goal-oriented) picture processing as well as bottom-up verification of consistent spatial relations among objects. Author

N85-16262*# Kansas Univ., Lawrence. Telecommunications and Information Sciences Lab.

POWER SPECTRAL ENSITY OF MARKOV TEXTURE FIELDS **c65**

K. Sam Shanmugan and J. C. Holtzman *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 303-307 refs ERTS (For primary document see N85-16251 07-43)

(Contract NAS9-16664)

Avail: NTIS HC A25/MF A01 CSCL 12A

Texture is an important image characteristic. A variety of spatial domain techniques were proposed for extracting and utilizing textural features for segmenting and classifying images. for the most part, these spatial domain techniques are ad hos in nature. A markov random field model for image texture is discussed. A frequency domain description of image texture is derived in terms of the power spectral density. This model is used for designing optimum frequency domain filters for enhancing, restoring and segmenting images based on their textural properties. Author

N85-16263*# Purdue Univ., Lafayette, Ind. School of Civil Engineering.

RECTIFICATION OF SINGLE AND MULTIPLE FRAMES OF SATELLITE SCANNER IMAGERY USING POINTS AND EDGES AS CONTROL **c64**

Fidel C. Paderes, Jr., Edward M. Mikhail, and Wolfgang Foerstner (Stuttgart Univ., West Germany) *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 309-400 refs ERTS (For primary document see N85-16251 07-43)

(Contract NAS9-16664)

Avail: NTIS HC A25/MF A01 CSCL 12A

Rectification of single and overlapping multiple scanner frames produced by such satellite-borne scanners as the LANDSAT MSS was carried out using a newly developed comprehensive parametric model. Tests with both simulated and real image data demonstrate conclusively that this model in general is superior to the widely used polynomial model, and that the simultaneous rectification of overlapping frames using least squares techniques yields a high accuracy than sngle frame rectification due to the inclusion of tie points between the image frames. Used to control, edges or lines, whic are much more likely to be found in images, can replace conventional control points and can easily be implemented into the least squares approach. An efficient algorithm for findng corresponding points in image paris was developed which can be used for determining tie points between image frames and thus increase the ecnomy of the whole rectification procedure. Author

N85-16264*# National Aeronautics and Space Administration. Earth Resources Labs., Bay St. Louis, Miss.

THE INFLUENCE OF THE NUMBER OF GROUND CONTROL POINTS ON THE SCENE-TO-MAP REGISTRATION ACCURACY

David D. Dow *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 401-426 refs ERTS (For primary document see N85-16251 07-43)

Avail: NTIS HC A25/MF A01 CSCL 05B

The optimum number of ground control points required to rectify a full scene or a portion of a LANDSAT MSS scene was investigated using data from southeastern Louisiana/southwestern Mississippi and eastern Kansas. The ground control points utilized were randomly distributed across the partial or full scene. This work suggest that 24 round control points are more than adequate to rectify a partial or full scene of LANDSAT MSS data. The error incurred in choosing ground control points representing artificial versus natural features was also studied. Author

N85-16265*# Boston Univ., Mass. Dept. of Geography.

IMAGE VARIANCE AND SPATIAL STRUCTURE IN REMOTELY SENSED SCENES

Curtis E. Woodcock and Alan H. Strahler (City Univ. of New York) *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 427-465 refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)

Avail: NTIS HC A25/MF A01 CSCL 05B

Digital images derived by scanning air photos and through acquiring aircraft and spcecraft scanner data were studied. Results show that spatial structure in scenes can be measured and logically related to texture and image variance. Imagery data were used of a South Dakota forest; a housing development in Canoga Park, California; an agricltural area in Mississppi, Louisiana, Kentucky, and Tennessee; the city of Washington, D.C.; and the Klamath National Forest. Local variance, measured as the average standard deviation of brightness values within a three-by-three moving window, reaches a peak at a resolution cell size about two-thirds to three-fourths the size of the objects within the scene. If objects are smaller than the resolution cell size of the image, this peak does not occur and local variance simply decreases with increasing resolution as spatial averaging occurs. Variograms can also reveal the size, shape, and density of objects in the scene. R.S.R.

N85-16266*# SRI International Corp., Menlo Park, Calif. Artificial Intelligence Center.

IMAGE-TO-IMAGE CORRESPONDENCE: LINEAR STRUCTURE MATCHING **c64**

Grahame B. Smith and Helen C. Wolf *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 467-487 refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)

(Contracts NAS9-16664; MDA903-83-C-0027)

Avail: NTIS HC A25/MF A01 CSCL 12A

The task of matching images of a scene was examined when images are taken from very different vantage points, when there is cnsiderable scale change, and when the image orientations are unknown. The linear structures in the scene were used as the basis of the correspondence procedure. The problem of describing the linear structures in a manner that is invariant relative to the variations that can occur among images is considered. A method of finding the best description of the linear structures is discussed. Author

N85-16267*# Maryland Univ., College Park.

ANALYSIS OF SUBPIXEL REGISTRATION **c64**

Carlos A. Berenstein, Laveen N. Kanal, David Lavine, Eric C. Olson, and Eric Slud *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 489-594 refs Prepared in cooperation with LNK Corp., Silver Spring, Md. ERTS (For primary document see N85-16251 07-43)

Avail: NTIS HC A25/MF A01 CSCL 12A

The area of subpixel accuracy in image registration and edge detection was studied. Two main directions of research were pursued, edge detection and matching based on the digital geometry of edges, and random field models for probablistic analysis of registration error. In the edge detection approach, error bounds and error probabilities were computed using theoretical models. Algorithms were developed and tests on simulated imagery. The methods appear promising for high accuracy edge position estimation and registration, though further refinement of the procedures is required. Using random field models, a statistical measure of the quality of the cross correlation peak as an estimate of the offset between a sensed and a reference image was developed. Simulations were performed to determine the validity of this estimte with real imagery and to study the results of interpolating digital correlation functions to estimate the translation offset to subpixel accuracy. Author

N85-16268*# Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
STUDY OF SPECTRAL/RADIOMETRIC CHARACTERISTICS OF THE THEMATIC MAPPER FOR LAND USE APPLICATIONS Quarterly Status Technical Progress Report, 21 Jun. - 20 Sep. 1984
William A. Malila, Principal Investigator and Michael D. Metzler Oct. 1984 38 p refs ERTS
(Contract NAS5-27346)
(E85-10057; NASA-CR-174229; NAS 1.26:174229; ERIM-164000-13-P; QSTPR-8) Avail: NTIS HC A03/MF A01 CSCL 08B

Progress during the Environmental Research Institute of Michigan-ERIM's and 5 image data quality assessment program for the thematic mapper is described. Analyses of LANDSAT 5 TM radiometric characteristics were performed. Effects which had earlier been found in LANDSAT 4 TM data were found to be present in LANDSAT 5 data as well, including: (1) scan direction related signal droop; (2) scan correlated level shifts; and (3) low frequency coherent noise. Coincident LANDSAT 4 and 5 raw TM data were analyzed, and band by band relationships between the two sensors were derived. Earlier efforts which developed an information theoretic measure of multispectral information content were continued, comparing TM and MSS information content.
Author

N85-16269*# Environmental Research Inst. of Michigan, Ann Arbor.
GROWTH/REFLECTANCE MODEL INTERFACE FOR WHEAT AND CORRESPONDING MODEL Final Report, Mar. - Dec. 1984
Gwynn H. Suits, Russel Sieron, and Julie Odenweller Dec. 1984 30 p refs ERTS
(Grant NAS5-83)
(E85-10058; NASA-CR-174230; NAS 1.26:174230; ERIM-166500-4-F) Avail: NTIS HC A03/MF A01 CSCL 02C

The use of modeling to explore the possibility of discovering new and useful crop condition indicators which might be available from the Thematic Mapper and to connect these symptoms to the biological causes in the crop is discussed. A crop growth model was used to predict the day to day growth features of the crop as it responds biologically to the various environmental factors. A reflectance model was used to predict the character of the interaction of daylight with the predicted growth features. An atmospheric path radiance was added to the reflected daylight to simulate the radiance appearing at the sensor. Finally, the digitized data sent to a ground station were calculated. The crop under investigation is wheat. M.G.

N85-16270*# Santa Barbara Research Center, Calif.
THEMATIC MAPPER. VOLUME 1: CALIBRATION REPORT FLIGHT MODEL, LANDSAT 5 Final Report
R. C. Cooley and J. C. Lansing Sep. 1984 248 p ERTS 11 Vol.
(Contract NAS5-24200)
(E85-10059; NASA-CR-174231; NAS 1.26:174231; HS236-9060-Vol-1) Avail: NTIS HC A11/MF A01 CSCL 14B

The calibration of the Flight 1 Model Thematic Mapper is discussed. Spectral response, scan profile, coherent noise, line spread profiles and white light leaks, square wave response, radiometric calibration, and commands and telemetry are specifically addressed. M.G.

N85-16271*# Santa Barbara Research Center, Calif.
THEMATIC MAPPER. VOLUME 2: FLIGHT MODEL PRESHIPMENT REVIEW
23 Sep. 1982 250 p ERTS 11 Vol.
(Contract NAS5-24200)
(E85-10060; NASA-CR-174232; NAS 1.26:174232) Avail: NTIS HC A11/MF A01 CSCL 14B

The various systems of the Thematic Mapper are reviewed and a comparison of measured and specified performance is given. Test methodologies are described. The specific instrument systems discussed include the power supply assembly, scan mirror, electronics module, focal plane assembly, radiometer, and radiation cooler. M.G.

N85-16272*# Massachusetts Univ., Amherst. Dept. of Geology and Geography.
THE MINERALOGY OF GLOBAL MAGNETIC ANOMALIES Final Technical Report
Stephen E. Haggerty, Principal Investigator Dec. 1984 156 p refs ERTS
(Contract NAS5-26414)
(E85-10061; NASA-CR-174242; NAS 1.26:174242) Avail: NTIS HC A08/MF A01 CSCL 08G

Experimental and analytical data on magnetic mineralogy was provided as an aid to the interpretation of magnetic anomaly maps. An integrated program, ranging from the chemistry of materials from 100 or more km depth within the Earth, to an examination of the MAGSAT anomaly maps at about 400 km above the Earth's surface, was undertaken. Within this framework, a detailed picture of the pertinent mineralogical and magnetic relationships for the region of West Africa was provided. Efforts were directed toward: (1) examining the geochemistry, mineralogy, magnetic properties, and phases relations of magnetic oxides and metal alloys in rocks demonstrated to have originated in the lower crust of upper mantle, (2) examining the assumption that these rocks portray the nature of their source regions; and (3) examining the regional geology, tectonics, gravity field and the MAGSAT anomaly maps for West Africa. M.G.

N85-16273*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SIMULTANEOUS OCEAN CROSS-SECTION AND RAINFALL MEASUREMENTS FROM SPACE WITH A NADIR-POINTING RADAR
Robert Meneghini and David Atlas Nov. 1984 46 p refs (NASA-TM-86167; NAS 1.15:86167) Avail: NTIS HC A03/MF A01 CSCL 04B

A method to determine simultaneously the rainfall rate and the normalized backscattering cross section of the surface was evaluated. The method is based on the mirror reflected power, p sub m which corresponds to the portion of the incident power scattered from the surface to the precipitation, intercepted by the precipitation, and again returned to the surface where it is scattered a final time back to the antenna. Two approximations are obtained for P sub m depending on whether the field of view at the surface is either much greater or much less than the height of the reflection layer. Since the dependence of P sub m on the backscattering cross section of the surface differs in the two cases, two algorithms are given by which the path averaged rain rate and normalized cross section are deduced. The detectability of P sub m, the relative strength of other contributions to the return power arriving simultaneous with P sub m, and the validity of the approximations used in deriving P sub m are discussed. E.A.K.

N85-16274# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
FORECASTING WATER TEMPERATURE DECLINE AND FREEZE-UP IN RIVERS
H. T. Shen, E. P. Foltyn, and S. F. Daly Jul. 1984 24 p
(AD-A147068; CRREL-84-19) Avail: NTIS HC A02/MF A01 CSCL 08/8

In this study a method for making long-range forecasts of freeze-up dates in rivers is developed. The method requires the initial water temperature at an upstream station, the long-range air temperature forecast, the predicted mean flow velocity in the river reach, and water temperature response parameters. The water temperature response parameters can be either estimated from the surface heat exchange coefficient and the average flow depth or determined empirically from recorded air and water temperature data. The method is applied to the St. Lawrence River between Kingston, Ontario, and Massena, New York, and is shown to be capable of accurately forecasting freeze-up. Originator-supplied keywords include: Ice formation, and River ice. GRA

N85-16275# Ohio State Univ., Columbus.
AN INTERACTIVE FORTRAN PROGRAM FOR DETERMINING RELIABILITY OF PSEUDO-RANGE GEODETIC POINT POSITIONING USING THE GLOBAL POSITIONING SYSTEM M.S. Thesis. Final Report
J. R. Ackeret 13 Aug. 1984 76 p Sponsored by Army
(AD-A147133; DMAHTC-84-039) Avail: NTIS HC A05/MF A01 CSCL 08/5

A transportable, generic, interactive FORTRAN program for the covariance analysis off pseudo-range experiments in the Global Positioning System (GPS) is presented for use in simulation studies, experiment planning and systems development. The interactive mode is especially suited for covariance analyses involving multiple parameters, by allowing ease of operation for data production and providing savings in time when computing geodetic point positioning. The mathematical models on which the program is based provide an overview of the GPS point positioning process, emphasizing the areas of interest to geodesy. Also, special emphasis is placed upon station tracking geometry. The FORTRAN program allows for understanding correlation coefficients between the various parameters. A separate model suitable for covariance analysis is also presented. This interactive FORTRAN program has been implemented on the UNIVAC at Defense Mapping Agency Hydrographic/Topographic Center. The program is effective and efficient in helping to establish the realiability of the GPS point positioning technique. The program can be used in simulation studies, planning test and evaluation experiments, and GPS software development. The question/answer method has been used to develop this iterative program which enables the user to sit at the computer terminal (scope) and rapidly assess the expected accuracy of the GPPS point positioning technique as applied to a particular survey of interest. GRA

N85-16276# Purdue Univ., Lafayette, Ind. School of Civil Engineering.
METRIC ASPECTS OF DIGITAL IMAGES AND DIGITAL IMAGE PROCESSING Final Report, Apr. 1981 - Sep. 1984
E. M. Mikhail and O. R. Mitchell Sep. 1984 100 p
(Contract DAAG29-81-K-0063)
(AD-A147211; CE-PH-84-9; ARO-17508.8-GS) Avail: NTIS HC A05/MF A01 CSCL 08/2

The ability of human pointing in digitized aerial imagery is studied. Automated methods for extracting edge locations in digital imagery are determined with subpixel accuracy. An algorithm for automatically extracting cross targets from aerial imagery is developed and implemented. Crosses are recognized using a method based on Fourier descriptors. Precise locations of the crosses are determined by Fourier descriptions and further refined using a least squares adjustment model. Mean cross location errors are as low as 0.03 pixels. Metric distortions caused by digital image processing techniques are studied using the Fourier descriptor-least squares algorithms. Cross positions are shifted by as much as 0.5 pixels when cosine compression is applied with a 16-fold bit reduction. Mean and median filters show little metric distortions. An isotropic median filter is developed. Resampling with various interpolation functions shows that metric distortion is lower when using bilinear interpolation as compared to nearest neighbor or bucubic interpolation. GRA

N85-16277# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
BUCKLING ANALYSIS OF CRACKED, FLOATING ICE SHEETS
M. D. Adley and D. S. Sodhi Aug. 1984 34 p
(AD-A147330; CRREL-SR-84-23) Avail: NTIS HC A03/MF A01 CSCL 20/11

A buckling analysis of cracked, floating ice sheets is presented; both symmetrical and unsymmetrical shapes were investigated. The finite element method was used for the in-plane analysis as well as the out-of-plane analysis. The results of the analyses of symmetrically shaped ice sheets are compared to those of previous analyses where a radial stress field was assumed for the in-plane stresses, and there is good agreement between them. The results of theoretical analyses are compared to experimental data obtained in small-scale laboratory experiments. Author (GRA)

N85-16278# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
ICE DYNAMICS
W. D. Hibler, III Jul. 1984 61 p
(AD-A147376; CRREL-Mono-84-3) Avail: NTIS HC A04/MF A01 CSCL 08/12

This monograph reviews essential aspects of sea ice dynamics on the geophysical scale and discusses the role of ice dynamics in air-sea-ice interaction. The review is divided into the following components: (1) a discussion of the momentum balance describing ice drift, (2) an examination of the nature of sea ice rheology on the geophysical scale, (3) an analysis of the relationship between ice strength and ice thickness characteristics, and (4) a discussion of the role of ice dynamics in the atmosphere-ice-ocean system. Because of the unique, highly nonlinear nature of sea-ice interaction, special attention is given to the ramifications of ice interaction on sea ice motion and deformation. These ramifications are illustrated both by analytic solution and by numerical model results. In addition, the role of ice dynamics in the atmosphere-ice-ocean system is discussed in light of numerical modeling experiments, including a fully coupled ice-ocean model of the Arctic-Greenland-Norwegian seas. GRA

N85-16279# Iowa Univ., Iowa City. Inst. of Hydraulic Research.
FRAZIL ICE FORMATION
R. Ettema, M. F. Karim, and J. F. Kennedy Jul. 1984 53 p
(Contract DACA89-79-C-0010; Grant NSF CEE--09252)
(AD-A147425; CRREL-84-18) Avail: NTIS HC A04/MF A01 CSCL 08/12

Fazil ice forms in flowing or turbulent water becomes supercooled by heat transfer to overlying air. The influences of turbulence and water are investigated. temperature on frazil ice formation. The rate and the quantity of frazil ice formed in a specified volume of supercooled water increase with both increasing turbulence intensity and decreasing water temperature. The influence of turbulence intensity on the rate of frazil ice formation, however, is more pronounced for larger initial supercooling. The turbulence characteristics of a flow affect the rate of frazil ice formation by governing the temperature to which the flow can be supercooled, by influencing heat transfer from the frazil ice to surrounding water, and by promoting collision nucleation, particle and floc rupture and increasing the number of nucleation sites. An analytical model, in which the rate of frazil ice formation is related to temperature rise of a turbulent volume of water from the release of latent heat of fusion of liquid water to ice is developed. GRA

N85-16280# Harvard Coll. Observatory, Cambridge, Mass.
RESEARCH IN GEODESY BASED UPON RADIO INTERFEROMETRIC OBSERVATIONS OF EXTRAGALACTIC RADIO SOURCES Technical Report
T. A. Herring, J. L. Davis, and I. I. Shapiro Hanscom AFB, Mass. AFGL May 1984 42 p
(Contract F19628-83-K-0031)
(AD-A147581; AFGL-TR-84-0143; SR-1) Avail: NTIS HC A03/MF A01 CSCL 08/5

Very-long-baseline interferometric (VLBI) observations obtained from a network of radio telescopes distributed in North America and Europe have been analyzed to estimate the relative positions of the radio telescopes and the nutations of the Earth's rotation axis. In addition to the estimation of these geodetic parameters we have also used some of these data to study the Mark III instrumental performance, and the calibration of the atmospheric delay. Analysis of the Mark III instrumentation allowed us to isolate the probable cause of S-band group delay closure errors. These closure errors appear to be due to the effects of leakage of left-circularly polarized radiation into the output of feed horns which are designed to receive only right-circularly polarized radiation. This instrumental error appears to have affected the ionospheric-calibrated group delays at the 1 cm level. Investigations of the effects of the atmospheric delay calibration on estimates of

geodetic parameters have disclosed that the elevation angle dependence of the dry atmospheric delay model (Marini model) may be biased. We suspect that this delay model may be biased by about 10 cm at 10 deg elevation angle. A bias of this magnitude is not unlikely because two models of the elevation angle dependence of the atmospheric delay differ by about 6 cm at 10 deg elevation angle. GRA

N85-16281# Naval Ocean Research and Development Activity, Bay St. Louis, Miss.

BIO-OPTICAL VARIABILITY IN THE ALBORAN SEA AS ASSESSED BY NIMBUS-7 COASTAL ZONE COLOR SCANNER Final Report

P. E. LaViolette and R. A. Arnone Aug. 1984 32 p (F59-553)

(AD-A147909; NORDA-TN-283) Avail: NTIS HC A03/MF A01 CSCL 08/1

An international oceanographic experiment, was conducted in 1982 in the Alboran Sea in which a specialized portion was dedicated to examining the spatial and temporal variability of bio-optical properties around the Alboran Sea Gyre. The circulation of the Alboran Sea, as characterized by Atlantic Inflow (through the Strait of Gibraltar), The Alboran Gyre, and coastal water masses, was analyzed through use of Nimbus-7 Coastal Zone Color Scanner (CZCS) imagery, NOAA-7 Advanced Very High Resolution Radiometer (AVHRR) imagery, and aircraft and ship data. Diffuse attenuation coefficients calculated from CZCS data are in agreement with the ship data. A strong correlation between the surface temperature and ocean color fronts was observed in the two satellite imagery sets. A 6-day sequence of CZCS imagery shows that significant changes in the diffuse attenuation coefficient and phytoplankton pigment concentration occurred in the frontal regions. These changes are attributed to the bio-optical horizontal and vertical variations that occurred within the first attenuation length. Author (GRA)

N85-16282# Naval Ocean Research and Development Activity, Bay St. Louis, Miss.

SATELLITE DEFINITION OF THE BIO-OPTICAL AND THERMAL VARIATION OF COASTAL EDDIES ASSOCIATED WITH THE AFRICAN CURRENT Final Report

R. A. Arnone and P. E. LaViolette Sep. 1984 24 p

(AD-A147910; NORDA-TN-291) Avail: NTIS HC A02/MF A01 CSCL 08/3

The circulation of the African oceanic currents along the north coasts of Morocco, Algeria, and Tunisia are shown by numerous seasonal satellite imagery as a series of complex anticyclonic eddies. An eastward propagation of the eddy field indicates a significant net transport. Turbulent shear flow of the African current interacting with the coast results in the advection of coastal waters into the offshore waters of the eddy field. The biological activity and chemical reactions spawned by the interaction of offshore and coastal water properties are clearly observed in the Coastal Zone Color Scanner (CZCS) by ocean color changes. High suspended sediments concentrations from the coastal waters were observed to border the periphery of the eddies. Sea surface temperature shown by NOAA-7 AVHRR imagery also illustrate complex flow although in some imagery the ocean color imaging better defines the patterns. Applications of both visible and ocean color imagery are suggested as a method of determining the flow patterns. Originator-supplied keywords include: Satellite imagery, and Western Mediterranean. GRA

N85-16283# Alabama Univ., University. School of Mines and Energy Development.

ALABAMA TIN BELT: METALLOGENESIS AND MINERAL RESOURCE EVALUATION. YEAR-END REPORT Progress Report

S. I. Usdansky and N. L. Green Apr. 1984 82 p refs

(DE84-901335; NP-4901335) Avail: NTIS HC A05/MF A01

The Alabama Tin Belt is a 20 km long 3 km wide zone in Tallapossa County, Alabama along which tin deposits occur in veins and pegmatites associated with granitoids of the Pinckneyville Complex. Computer based algorithms were developed to calculate granite chemistry from modal mineralogy (GRCHEM) and to calculate modal mineralogy from whole rock chemical analyses (PERANORM). Fluorine abundances in Alabama Tin Belt granites and their biotites were determined by a selective ion electrode method. Granite, increase slightly from 211 to 273 ppM with ncreasing SiO2 contents, and remains relatively constant with increasing K2O, Rb and Ba contents. It is suggested that distinctive fluorine distribution patterns of the individual plutons are related to different degrees of biotite, muscovite nd apatite crystallization. The fluorine concentrations in Alabama Tin Belt granites, pegmatites and associated tin ores are generally lower than those reported from granites of other tin provinces. It is suggested that fluorine may not have been a significant component of the mineralizing fluids, and that other complexing agents, such as CO2, derived by oxidation of graphitic country rocks, may have dominated the ore forming fluids. DOE

N85-16284# European Space Agency, Paris (France).

ENHANCEMENT OF MULTISPECTRAL SCANNER IMAGES BY DIGITAL FILTERING

Peter Nowak May 1984 141 p refs Transl. into ENGLISH of "Bildverbesserung an multispektralen Scanneraufnahmen mit Hilfe digitaler Filterverfahren', DFVLR, Oberpfaffenhofen, West Ger. Report DFVLR-FB-79-11, 1979

(ESA-TT-624; DFVLR-FB-79-11) Avail: NTIS HC A07/MF A01; original German version available from DFVLR, Cologne DM 28

The possibilities for image enhancement of multispectral scanner images using two-dimensional digital filters were investigated. The theory of imaging system, possible distortions during image recording, and the theoretical basics of nonrecursive digital filtering were examined. Design techniques for digital filters are described. Results of the application of digital filter techniques to multispectral scanner data are presented. It is shown that the filtering and elimination of image distortions can have a favorable effect on subsequent image processing steps (e.g., multispectral classification). Author (ESA)

N85-16285# Battelle Inst., Frankfurt am Main (West Germany). Fachbereich Laser and Optik.

REMOTE SENSING OF ATMOSPHERIC GASES WITH CO2 LASERS. CONTINUATION AND CONCLUSION OF SPECTROSCOPIC INVESTIGATIONS Final Report, Mar. 1979

Joerg Boscher, Gerd Schaefer, and Wolf Wiesemann Bonn Bundesministerium fuer Forschung und Technologie Oct. 1984 266 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-W-84-030; ISSN-0170-1339) Avail: NTIS HC A12/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 43

Spectroscopic investigations were carried out to provide the physical data base for the evaluation of operational differential-absorption measurements performed with the airborne DIALEX instrument and to identify optimum performance requirements. The measured absorption cross sections of CH3Cl, C2HCl3, C3H6, C3H8, C4H6, O3, and SF6 for the emission lines of the (C-12)(O-16)2 and (C-12)(O-18)2 laser are tabulated together with the pressure dependence measured in pure gases and mixtures with synthetic air. The temperature dependence in the range between 260 and 360 K is also indicated. The data of 17 gases were prepared for computer processing and stored on magnetic tape. On/off resonance lines and minimum detectable concentrations and interference effects are presented. The special requirements of optimum heterodyne detection are discussed, leading to optimized system performance. Author (ESA)

N85-16286# Bureau of Mines, Washington, D. C.

GEOSTATISTICS FOR RESOURCE AND RESERVE ESTIMATION Open File Report, Oct. 1982 - Jun. 1984

L. V. Coppa, E. K. Green, and C. K. Quan Jun. 1984 116 p refs

(PB85-105781/GAR; BM-OFR-168-84) Avail: NTIS HC A06/MF A01 CSCL 08I

This report describes a technique for enhancing ore reserve estimations using geostaistics, the methodology of which combines the spatial and random aspects of geologic phenomena into a formal theoretical framework for deriving the estimation variance of ore reserves. Correctly used, geostatistics enables confidence intervals to be placed around ore reserve estimates calculated from drill hole data. A geostatistical software system was obtained from the U.S. Geological Survey and installed, after slight modifications, on the Bureau's Wang computer. System testing and validation was conducted using a simple textbook type example. This was then followed by variogram analysis, point kinging and block kinging of data from a previously worked section of a uranium mine. GRA

N85-16287# Global Geochemistry Corp., Canoga Park, Calif.
ANALYSIS OF GASES IN THE EARTH'S CRUST Annual Report, 1 Jan. 1983 - 31 Dec. 1983
P. D. Jenden 1 Mar. 1984 238 p refs Sponsored by Gas Research Inst.
(PB85-113397/GAR; GRI-84/0065) Avail: NTIS HC A11/MF A01 CSCL 07D

Natural gas accumulations have complex compositions which depend on many controlling factors, including source, depth of burial, time of formation, migraton history and geothermal gradient of the local region. The research project being conducted has collected approximately three hundred samples of gas from numerous fields in North America for the analysis of hydrocarbon, fixed gas, and inert gas components. In addition, over 500 samples of cuttings gas, core material soils, geothermal and oil field fluids, gas hydrates and submarine volcanic gases have also been acquired. Where feasible, D/H, 13C/12C, 15N/14N, 18O/16O and 34S/32S ratios are measured on CH4, C2H6, C3H8, H2, CO2, N2 and H2S. To date, the contribution of deep abiogenic methane derived from the upper mantle to known natural gas accumulations has not been demonstrated in this study. GRA

N85-16288# National Academy of Sciences - National Research Council, Washington, D. C.
EARTH SCIENCE INVESTIGATIONS IN THE UNITED STATES ANTARCTIC RESEARCH PROGRAM (USARP) Summary Report, 1 Jul. 1983 - 30 Jun. 1984
David H. Elliot, comp. 1984 111 p
(Grant NSF DDP-82-07098)
(PB84-240506) Avail: NTIS HC A03/MF A01 CSCL 08G

A listing of earth science research activities conducted as part of the U.S. Antarctic Research Program for the year July 1, 1983, through June 30, 1984. Publications resulting from the research are also listed. Information was obtained by a survey of participants in the U.S. Antarctic Program, with respondents providing the data on their work in camera ready format. Geophysics, atmospherics, mineralogy, and paleomagnetism are among the topics discussed. GRA

N85-16289# Illinois State Water Survey, Champaign.
IN-LAKE WATER QUALITY MANAGEMENT FOR LAKE EUREKA: HIGHLIGHTS OF THIRD YEAR (1983) OPERATION
Raman K. Raman, Davis B. Beuscher, and Benny R. Arbuckle 1984 20 p refs
(PB85-104149/GAR; ISWS/CIR-162/84) Avail: NTIS HC A02/MF A01 CSCL 08H

A low energy mechanical reversible draft aerator was installed in Lake Eureka, IL, in 1981. With the aerator in place and with chemical applications to control blue green algae, factors in the lake that had been identified as causing taste and odor problems in the finished waters were reduced or altered, improving the lake water quality. In 1982, the city of Eureka reverted to the lake from groundwater as its water supply source, resulting in a significant savings in power consumption and chemicals used. The aerator was then operated successfully during the summer of 1982, the winter of 1982-83 and the summer of 1983, its third year of operation. Despite two unexpected occurrences in August 1983 - a massive algal bloom of green algae and a fish kill - the water quality characteristics of the raw water remained satisfactory. GRA

N85-16290# Forest Service, New Orleans, La. Southern Forest Experiment Station.
FOREST AREA ESTIMATES FROM LANDSAT MSS AND FOREST INVENTORY PLOT DATA
Richard A. Birdsey, W. Frank Miller, Jon Clark, and Robert H. Smith Sep. 1984 12 p refs
(PB85-105617/GAR; FSRP/SO-211) Avail: NTIS HC A02/MF A01 CSCL 02F

Forest area estimates for Puerto Rico from LANDSAT multispectral scanner data were compared with area estimates derived from black and white aerial photographs. These estimates for forest resource evaluation are discussed. The sampling error for LANDSAT data was nearly twice the sampling error for photointerpreted data. GRA

N85-16224# Joint Publications Research Service, Arlington, Va.
AUTOMATED LAVINA COLLECTS DATA ON SNOW
A. Muratov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 1-2 Transl. into ENGLISH from Izv. (Moscow), Aug. 1984 p 6 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16226# Joint Publications Research Service, Arlington, Va.
MARITIME PROSPECTING, MINING DISCUSSED
Yu. B. Kazmin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 9-13 Transl. into ENGLISH from Razvedk. i Okhr. Nedr (Moscow), no. 7, Jul. 1984 p 57-60 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16234# Joint Publications Research Service, Arlington, Va.
NEW DATA ON PRESENCE OF ORES IN SALT DOME STRUCTURES OF DNIEPER-DONETS BASIN Abstract Only
B. V. Kolishniy *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 91 Transl. into ENGLISH from Dokl.. Akad. Nauk Ukr. SSR, Ser. B: Geol. Khim. i Biol. Nauk. (Kiev), no. 9, Sep. 1984 p 3-5 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16238# Joint Publications Research Service, Arlington, Va.
INTERPRETING GEOTHERMAL ANOMALIES BY SPECIAL POINTS METHOD Abstract Only
R. I. Kutas and V. A. Tsvyashchenko *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 94 Transl. into ENGLISH from Dokl. Akad. Nauk Ukr. SSSR, Ser. B: Geol. Khim. i Biol. Nauk. (Kiev), no. 4, Apr. 1984 p 13-16 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16239# Joint Publications Research Service, Arlington, Va.
SATELLITE PHOTOGRAPHS SUGGEST ARCTIC VOLCANO
Yu. Masurenkov and O. Dzyuba *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 99-100 Transl. into ENGLISH from Izv. (Moscow), 31 May 1984 p 6 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16317# Joint Publications Research Service, Arlington, Va.
OIL-SHALE EXPLORATION EXPANSION URGED
M. V. Golitsyn and L. M. Prokofyeva *In its* USSR Rept.: Energy (JPRS-UEN-84-038) 28 Dec. 1984 p 134-138 refs Transl. into ENGLISH from Ugol (Moscow), no. 10, Oct. 1984 p 10-11 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

44 ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

N85-16291*# Westinghouse Electric Corp., Pittsburgh, Pa. Advanced Energy Systems Div.

GAS COOLED FUEL CELL SYSTEMS TECHNOLOGY DEVELOPMENT Final Report

J. M. Feret Aug. 1983 329 p refs

(Contracts DEN3-390; DE-AI01-80ET-17088)

(NASA-CR-174732; DOE/NASA/0290-1; NAS 1.26:174732) Avail: NTIS HC A15/MF A01 CSCL 10B

The first phase of a planned multiphase program to develop a Phosphoric is addressed. This report describes the efforts performed that culminated in the: (1) Establishment of the preliminary design requirements and system conceptual design for the nominally rated 375 kW PAFC module and is interfacing power plant systems; (2) Establishment of PAFC component and stack performance, endurance, and design parameter data needed for design verification for power plant application; (3) Improvement of the existing PAFC materials data base and establishment of materials specifications and process procedes for the cell components; and (4) Testing of 122 subscale cell atmospheric test for 110,000 cumulative test hours, 12 subscale cell pressurized tests for 15,000 cumulative test hours, and 12 pressurized stack test for 10,000 cumulative test hours. B.W.

N85-16292*# Life Systems, Inc., Cleveland, Ohio.

ENGINEERING MODEL SYSTEM STUDY FOR A REGENERATIVE FUEL CELL: STUDY REPORT

B. J. Chang, F. H. Schubert, A. J. Kovach, and R. A. Wynveen Sep. 1984 91 p refs

(Contract NAS3-21287)

(NASA-CR-174801; NAS 1.26:174801; LSI-TR-376-30) Avail: NTIS HC A05/MF A01 CSCL 10A

Key design issues of the regenerative fuel cell system concept were studied and a design definition of an alkaline electrolyte based engineering model system or low Earth orbit missions was completed. Definition of key design issues for a regenerative fuel cell system include gaseous reactant storage, shared heat exchangers and high pressure pumps. A power flow diagram for the 75 kW initial space station and the impact of different regenerative fuel cell modular sizes on the total 5 year to orbit weight and volume are determined. System characteristics, an isometric drawing, component sizes and mass and energy balances are determined for the 10 kW engineering model system. An open loop regenerative fuel cell concept is considered for integration of the energy storage system with the life support system of the space station. Technical problems and their solutions, pacing technologies and required developments and demonstrations for the regenerative fuel cell system are defined. E.A.K.

N85-16293*# Georgia Tech Research Inst., Atlanta.

INFRARED TECHNOLOGY FOR SATELLITE POWER CONVERSION Semiannual Status Report

D. P. Campbell, M. A. Gouker, and J. J. Gallagher 11 Dec. 1984 26 p refs

(Grant NAG3-282)

(NASA-CR-174266; NAS 1.26:174266) Avail: NTIS HC A03/MF A01 CSCL 10A

Successful fabrication of bismuth bolometers led to the observation of antenna action rom array elements. Fabrication of the best antennas arrays was made more facile with finding that increased argon flow during the dc sputtering produced more uniform bismuth films and bonding to antennas must be done with the substrate temperaure below 100 C. Higher temperatures damaged the bolometers. During the testing of the antennas, it was found that the use of a quasi-optical system provided a uniform radiation field. Groups of antennas were bonded in series and in parallel with the parallel configuration showing the greater response. R.S.F.

N85-16294*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

RESULTS OF THE 1984 NASA/JPL BALLOON FLIGHT SOLAR CELL CALIBRATION PROGRAM

R. G. Downing and R. S. Weiss 15 Oct. 1984 17 p refs

(Contract NAS7-918)

(NASA-CR-174270; JPL-Publ-84-65; NAS 1.26:174270) Avail: NTIS HC A02/MF A01 CSCL 10A

The 1984 solar cell calibration balloon flight was successfully completed on July 19, meeting all objectives of the program. Thirty-six modules were carried to an altitude of 36.0 kilometers. The calibrated cells can now be used as reference standards in simulator testing of cells and arrays. Author

N85-16295*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

MULTIJUNCTION CELLS FOR CONCENTRATORS: TECHNOLOGY PROSPECTS

R. R. Ferber, comp., E. N. Costogue, comp., and K. Shimada, comp. 15 Nov. 1984 50 p refs

(JPL Proj. 5230-13; Contract DE-AI01-76ET-20356)

(NASA-CR-174259; JPL-Publ-84-71; NAS 1.26:174259; DOE/ET-20356/18) Avail: NTIS HC A03/MF A01 CSCL 10A

Development of high-efficiency multijunction solar cells for concentrator applications is a key step in achieving the goals of the U.S. Department of Energy National Photovoltaics Program. This report summarizes findings of an issue study conducted by the Jet Propulsion Laboratory Photovoltaic Analysis and Integration Center, with the assistance of the Solar Energy Research Institute and Sandia National Laboratories, which surveyed multijunction cell research for concentrators undertaken by federal agencies and by private industry. The team evaluated the potentials of research activities sponsored by DOE and by corporate funding to achieve projected high-efficiency goals and developed summary statements regarding industry expectations. Recommendations are made for the direction of future work to address specific unresolved aspects of multijunction cell technology. Author

N85-16296*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

ANTISOILING TECHNOLOGY: THEORIES OF SURFACE SOILING AND PERFORMANCE OF ANTISOILING SURFACE COATINGS

E. F. Cuddihy and P. B. Willis 15 Nov. 1984 35 p refs

(JPL Proj. 5101-251; Contract DE-AI01-76ET-20356)

(NASA-CR-174274; JPL-Publ-84-72; DOE/JPL-1012-102; NAS 1.26:174274) Avail: NTIS HC A03/MF A01 CSCL 10A

Physical examination of surfaces undergoing natural outdoor soiling suggests that soil matter accumulates in up to three distinct layers. The first layer involves strong chemical attachment or strong chemisorption of soil matter on the primary surface. The second layer is physical, consisting of a highly organized arrangement of soil creating a gradation in surface energy from a high associated with the energetic first layer to the lowest possible state on the outer surfce of the second layer. The lowest possible energy state is dictated by the physical nature of the regional atmospheric soiling materials. These first two layers are resistant to removal by rain. The third layer constitutes a settling of loose soil matter, accumulating in dry periods and being removed during rainy periods. Theories and evidence suggest that surfaces that should be naturally resistant to the formation of the first two-resistant layers should be hard, smooth, hydrophobic, free of first-period elements, and have the lowest possible surface energy. These characteristics, evolving as requirements for low-soiling surfaces, suggest that surfaces or surface coatings should be of fluorocarbon chemistry.

Evidence for the three-soil-layer concept, and data on the positive performance of candidate fluorocarbon coatings on glass and transparent plastic films after 28 months of outdoor exposure, are presented. Author

N85-16297*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
WHAT SHOULD DOE DO TO HELP ESTABLISH VOLUNTARY CONSENSUS STANDARDS FOR MEASURING AND RATING THE PERFORMANCE OF PV MODULES?
L. D. Runkle 31 Oct. 1984 54 p refs
(Contract NAS7-918; JPL Proj. 5220-30; Contract DE-AI01-76ET-20356)
(NASA-CR-174265; JPL-Publ-84-73; NAS 1.26:174265) Avail: NTIS HC A04/MF A01 CSCL 10A

In response to concern expressed by the photovoltaics community over progress toward the establishment and issuance of concensus standards on photovoltaic performance measurements, a review of the status of and progress in developing these standards was conducted. It examined the roles of manufacturers, and consumers and the national laboratories funded by the U.S. Department of Energy (DOE) in supporting this effort. This was done by means of a series of discussions with knowledgeable members of the photovoltaic community. Results of these interviews are summarized and a new approach to managing support of standards activity is recommended that responds to specific problems found in the performance measurement standards area. The study concludes that there is a positive role to be played by the U.S. Department of Energy in establishing collector performance measurement standards. It recommends that DOE continue to provide direct financial support for selected committees and for research at national laboratories, and that management of the activity be restructured to increase the authority and responsibility of the consensus committees. Author

N85-16298*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
PERFORMANCE AND COST OF ENERGY TRANSPORT AND STORAGE SYSTEMS FOR DISH APPLICATIONS USING REVERSIBLE CHEMICAL REACTIONS
Jeff M. Schredder and Tosh Fujita 15 Oct. 1984 57 p refs
(Contract NAS7-918; JPL Proj. 5105-142; Contract DE-AM04-80AL-13137)
(NASA-CR-174263; JPL-Publ-84-77; DOE/JPL-106-79; NAS 1.26:174263) Avail: NTIS HC A04/MF A01 CSCL 10C

The use of reversible chemical reactions for energy transport and storage for parabolic dish networks is considered. Performance and cost characteristics are estimated for systems using three reactions (sulfur-trioxide decomposition, steam reforming of methane, and carbon-dioxide reforming of methane). Systems are considered with and without storage, and in several energy-delivery configurations that give different profiles of energy delivered versus temperature. Cost estimates are derived assuming the use of metal components and of advanced ceramics. (The latter reduces the costs by three- to five-fold). The process that led to the selection of the three reactions is described, and the effects of varying temperatures, pressures, and heat exchanger sizes are addressed. A state-of-the-art survey was performed as part of this study. As a result of this survey, it appears that formidable technical risks exist for any attempt to implement the systems analyzed in this study, especially in the area of reactor design and performance. The behavior of all components and complete systems under thermal energy transients is very poorly understood. This study indicates that thermochemical storage systems that store reactants as liquids have efficiencies below 60%, which is in agreement with the findings of earlier investigators. B.W.

N85-16299*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SHUTDOWN CHARACTERISTICS OF THE MOD-O WIND TURBINE WITH AILERON CONTROLS Final Report
Dean R. Miller and Robert D. Corrigan 1984 23 p refs Presented at the Horizontal-Axis Wind Turbine Technol. Workshop, Cleveland, 8-10 May 1984
(Contract DE-AI01-76ET-20320)
(NASA-TM-86918; DOE/NASA/20320-61; E-2410; NAS 1.15:86918) Avail: NTIS HC A02/MF A01 CSCL 10B

Horizontal-axis wind turbines utilize partial or full variable blade pitch to regulate rotor speed. The weight and costs of these systems indicated a need for alternate methods of rotor control. Aileron control is an alternative which has potential to meet this need. The NASA Lewis Research Center has been experimentally testing aileron control rotors on the Mod-U wind turbine to determine their power regulation and shutdown characteristics. Experimental and analytical shutdown test results are presented for a 38 percent chord aileron-control rotor. These results indicated that the 38 percent chord ailerons provided overspeed protection over the entire Mod-O operational windspeed range, and had a no-load equilibrium tip speed ratio of 1.9. Thus, the 38 percent chord ailerons had much improved aerodynamic braking capability when compared with the first aileron-control rotor having 20 percent chord ailerons. B.W.

N85-16300*# Garrett Turbine Engine Co., Phoenix, Ariz.
ADVANCED TECHNOLOGY COGENERATION SYSTEM CONCEPTUAL DESIGN STUDY: CLOSED CYCLE GAS TURBINES Final Report
E. A. Ted Mock and Howard C. Daudet Oct. 1983 296 p Prepared in cooperation with Gibbs and Hill, Inc., New York, N.Y., Foster-Wheeler Co., Houston, Tex., and Little (Arthur D.) Co., Santa Monica, Calif.
(Contracts DEN3-215; DE-AI01-77ET-13111)
(NASA-CR-168222; DOE/NASA/0215-1; NAS 1.26:168222; GTEC31-4773) Avail: NTIS HC A13/MF A01 CSCL 10B

The results of a three task study performed for the Department of Energy under the direction of the NASA Lewis Research Center are documented. The thermal and electrical energy requirements of three specific industrial plants were surveyed and cost records for the energies consumed were compiled. Preliminary coal fired atmospheric fluidized bed heated closed cycle gas turbine and steam turbine cogeneration system designs were developed for each industrial plant. Preliminary cost and return-on-equity values were calculated and the results compared. The best of the three sites was selected for more detailed design and evaluation of both closed cycle gas turbine and steam turbine cogeneration systems during Task II. Task III involved characterizing the industrial sector electrical and thermal loads for the 48 contiguous states, applying a family of closed cycle gas turbine and steam turbine cogeneration systems to these loads, and conducting a market penetration analysis of the closed cycle gas turbine cogeneration system. Author

N85-16301*# National Aeronautics and Space Administration, Washington, D. C.
DEVELOPMENT OF LARGE WIND ENERGY POWER GENERATION SYSTEM
Jan. 1985 20 p Transl. into ENGLISH from Ishikawajima-Harima Eng. Rev. (Japan), v. 23, Nov. 1983 p 543-547 Previously announced in IAA as A84-25196 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-4004)
(NASA-TM-77779; NAS 1.15:77779) Avail: NTIS HC A02/MF A01 CSCL 10A

The background and development of an experimental 100 kW wind-energy generation system are described, and the results of current field tests are presented. The experimental wind turbine is a two-bladed down-wind horizontal axis propeller type with a 29.4 m diameter rotor and a tower 28 m in height. The plant was completed in March, 1983, and has been undergoing trouble-free tests since then. The present program calls for field tests during two years from fiscal 1983 to 1984. The development of technologies relating to the linkage and operation of wind-energy power generation system networks is planned along with the acquisition of basic data for the development of a large-scale wind energy power generation system. Author

N85-16302*# Lockheed Missiles and Space Co., Sunnyvale, Calif.
DEMONSTRATION OF TRANSPARENT SOLAR ARRAY MODULE DESIGN Final Report
George J. Pack Sep. 1984 79 p Prepared for JPL
(Contract JPL-956608)
(NASA-CR-174257; NAS 1.26:174257; LMSC-D973437) Avail: NTIS HC A05/MF A01 CSCL 10A

This report discusses the design, development, fabrication and testing of IR transparent solar array modules. Three modules, consisting of a baseline design using back surface reflector cells, and two modules using gridded back contact, IR transparent cells, were subjected to vacuum thermal balance testing to verify analytical predictions of lower operating emperature and increased efficiency. As a result of this test program, LMSC has verified that a significant degree of IR transparency can be designed into a flexible solar array. Test data correlates with both steady state and transient thermal analysis. Author

N85-16303# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
DEVELOPMENT OF DESIGN AND ECONOMIC PARAMETERS FOR PASSIVE SOLAR SYSTEMS M.S. Thesis
R. A. Woods and M. P. Harrison Sep. 1984 228 p
(AD-A147181; AD-E850744; AFIT/GEM/LSM/84S-10) Avail: NTIS HC A11/MF A01 CSCL 10/2

In order to reach the energy consumption goals established by executive Order 12003 and Public Law 95-356, the Air Force must integrate conservation measures with present technology. This analysis generates target design and economic parameters for one such technology - passive solar systems. This thesis provides the Air Force design manager with a three phase method of determining the economic feasibility of passive solar heating for a given Military Construction Project. In the first phase, guidelines are presented for preliminary sizing insulation levels and solar collection (glazing) area based on the building location and size. Next, the second phase presented a quantitative energy analysis to achieve an accurate estimate of the energy savings of a passive solar building using the guidelines from the first phase. Finally, the third phase presented a method for economic analysis of passive solar systems using life-cycle costing. This method determines whether the energy savings justifies the incremental increase in construction cost based on a 25 year payback period. GRA

N85-16304# Department of the Army, Washington, D. C.
RECHARGEABLE LITHIUM CELL Patent Application
M. Salomon and E. J. Plichta, inventors (to Army) Filed 27 Sep. 1984 9 p
(AD-D011302; US-Patent-Appl-SN-655114) Avail: NTIS HC A02/MF A01 CSCL 10/3

The general object of this invention is to provide an improved rechargeable lithium cell. A more specific object of the invention is to provide a rechargeable lithium cell having an improved low temperature performance and rate capability. It has now been found that the aformentioned objects can be attained using lithium as the anode, a solution of a lithium salt such as LiF6 or LiAlC14 in a mixed organic solvent as the electrolyte and a lithium intercalating cathode. GRA

N85-16305# Naval Surface Weapons Center, White Oak, Md.
SAFETY EVALUATION OF AN ELECTRONIC TOTALIZER CONTAINING A Li/(CF)x CELL
P. B. Davis, R. F. Bis, J. A. Barnes, S. E. Buchholz, and F. C. Debold 1 Nov. 1983 40 p
(AD-A147306; NSWC/TR-83-508) Avail: NTIS HC A03/MF A01 CSCL 10/3

A safety review and test program has been conducted on the Electronic Totalizer Model 799806-212 manufactured by Veeder-Root containing the Panasonic Lithium Polycarbonmonofluoride battery (one cell) BR-2/3A. The cell is used for the LCD display of the totalizer. Tests were conducted on the cell both inside the totalizer and alone. Tests included short circuit, forced discharge into voltage reversal, charging, heat tape, and gas sample collection of combustion products. The tests were run on both fresh cells and partially discharged cells. The forced discharge and charging tests were conducted at both the 250mA and 1 amp level. No fire or flame was noted during the tests with the exception of the heat tape runs. During heat tape tests fire was noted at 450 C. GRA

N85-16306# Army Construction Engineering Research Lab., Champaign, Ill.
EVALUATION OF THE MEASURED ENERGY PERFORMANCE OF FOUR SOLAR SYSTEMS Final Report
D. L. Johnson and D. C. Hittle Sep. 1984 84 p
(AD-A147912; CERL-TR-E-202) Avail: NTIS HC A05/MF A01 CSCL 10/1

This report describes the measured energy performance of four solar systems installed in military construction. Based on measured performance for a period of about 1 year, none of the solar systems provided the energy savings expected from the design calculations. When the fuel cost savings produced by the solar components of the systems were compared with the added solar costs, the solar systems had simple payback periods of more than 25 years. The field problems for the solar systems revealed by the study are discussed and related to system performance. The performance of all four systems suffered from control failures and excessive operation and maintenance (O/M) requirements. It was concluded that reliable, efficient designs must be simple and based on proven technologies. Recommendations for improving future solar designs are presented. Originator-supplied keywords include: solar heating, solar air conditioning, and military facilities. GRA

N85-16307# Department of the Air Force, Washington, D.C.
BATTERY CONTROL AND FAULT DETECTION METHOD Patent Application
W. S. Bishop, inventor (to Air Force) Filed 11 Jul. 1984 13 p
(AD-D011384; US-Patent-Appl-SN-629865) Avail: NTIS HC A02/MF A01 CSCL 10/2

This is a method for control, fault detection, fault isolation, and state-of-health monitoring of batteries and battery arrays. The method consists of measuring all of the battery, well, or cell group voltages, using statistics to determine a mean voltage and a standard deviation voltage, then comparing all of the measured voltages to the mean voltage. If the measured voltage deviates from the mean voltage by an arbitrary amount (number of standard deviations) corrective action can be implemented or an alarm signal given. The measurements need to be made rapidly enough to eliminate battery or cell voltage changes due to state of charge or temperature changes and, in most cases, require a computerized data collection/reduction system. Absolute high and/or low voltage limits can be included to prevent catastrophic events. The concept can be expanded to include similar temperature, pressure and/or battery current measurements in an array. Author (GRA)

N85-16308# Fraunhofer-Inst. fuer Solare Energiesysteme, Freiburg (West Germany).
SOLAR ENERGY CONVERSION BASED ON THE PRINCIPLE OF FLUORESCENT COLLECTORS. INSTALLATION OF A TEST COLLECTOR TO DELIVER SEVERAL WATTS POWER Final Report, Jun. 1983
Adolf Goetzberger, Siegfried Kunzelmann, Helen Rose Wilson, and Volker Wittwer Bonn Bundesministerium fuer Forschung und Technologie Sep. 1984 27 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-84-192; ISSN-0340-7608) Avail: NTIS HC A03/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 5,50

A model of a 1sq m fluorescent collector for solar energy conversion was developed and tested. Investigations of the long-term stability show that service life can exceed 5 yr. The electrical efficiency factor of 1% can be improved by altering the concentration of the dye. It remains almost constant at low

irradiation levels. The high transmission of the collector allows its use in semi-transparent systems like greenhouses. Author (ESA)

N85-16309# Fraunhofer-Inst. fuer Solare Energiesysteme, Freiburg (West Germany).
SOLAR ENERGY CONVERSION BASED ON THE PRINCIPLE OF FLUORESCENT COLLECTORS Final Report, Apr. 1983
Adolf Goetzberger, Klaus Heidler, Wilhelm Stahl, Helen Rose Wilson, Volker Wittwer, Armin Zastrow, and Heinz Langhals (Freiburg Univ., West Germany) Bonn Bundesministerium fuer Forschung und Technologie Sep. 1984 102 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-84-193; ISSN-0340-7608) Avail: NTIS HC A06/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 21,50

The development of fluorescent collectors for solar energy conversion is described. Spectra, fluorescent quantum yields, stability, and absorption properties of dyes were studied. The synthesis of dyes and the manufacture of collector plates are discussed. A Monte Carlo simulation of the fluorescent collector is given. Economic efficiency of applications is considered.
Author (ESA)

N85-16310# National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Dept.
DESIGN CRITERIA FOR SMALL WIND TURBINES
H. H. vanderLinden 30 Aug. 1983 11 p refs In DUTCH; ENGLISH summary Presented at Natl. Wind Energie Conf. 1983, Noordwijkerhout, Netherlands, 14-16 Sep. 1983
(NLR-MP-83054-U) Avail: NTIS HC A02/MF A01

A research program involving loads on small wind turbines was defined. Existing regulations result in very conservative design loads and do not allow for lower design loads when load alleviation concepts are used. The objective of this research program is to define simple but less conservative design criteria. Starting points, methods, and means of accomplishment are discussed. Author (ESA)

N85-16311# National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Div.
VERIFICATION OF THE FATIGUE PROPERTIES OF (SMALL) WIND TURBINES
H. H. vanderLinden 31 Aug. 1983 13 p refs In DUTCH; ENGLISH summary Presented at Natl. Wind Energie Conf. 1983, Noordwijkerhout, Netherlands, 14-16 Sep. 1983
(NLR-MP-83055-U) Avail: NTIS HC A03/MF A01

Aspects which play a role in the verification of the fatigue properties of small wind turbines are reviewed. Structural analysis identifying the fatigue critical areas, establishment of fatigue life by testing and analysis, and determination of load spectra are discussed. Author (ESA)

N85-16312# Joint Publications Research Service, Arlington, Va.
USSR REPORT: ENERGY
28 Dec. 1984 205 p refs Transl. into ENGLISH from various Russian articles
(JPRS-UEN-84-038) Avail: NTIS HC A10

News items, abstracts, and scientific reports on aspects of energy including oil and gas, coal, alternate fuels, nuclear power, and pipelines are described. For individual titles, see N85-16313 through N85-16318.

N85-16313# Joint Publications Research Service, Arlington, Va.
DEPUTY MINISTER DISCUSSES PLANS FOR GEOTHERMAL POWER
G. Shasharin *In its* USSR Rept.: Energy (JPRS-UEN-84-038) 28 Dec. 1984 p 125-126 Transl. into ENGLISH from Sots. Ind. (Moscow), 3 Oct. 1984 p 4 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

Geothermal technology and the utilization of geothermal resources in the U.S.S.R. are discussed. The difficulties presented by thermal anomalies and underground water circulation are examined. B.G.

N85-16314# Joint Publications Research Service, Arlington, Va.
PROGRESS IN DEVELOPING TIDAL ELECTRIC POWER PLANTS REPORTED
A. Blokhnin *In its* USSR Rept.: Energy (JPRS-UEN-84-038) 28 Dec. 1984 p 127-128 Transl. into ENGLISH from Izv. (Moscow), 1 Jul. 1984 p 1 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

The natural energy potential of tides on the shores of the U.S.S.R. is equal to about a third of the world's total. The Achilles heel of tidal power plants is their pulsating operation. One solution to this problem was to build a hydroelectric power plant for use in tandem with the tidal power plant. During lulls in the tidal plant, the hydraulic power plant switches on at full power. Possible sites for dual plants were discussed. B.G.

N85-16315# Joint Publications Research Service, Arlington, Va.
GEOTHERMAL WELLS DRILLED IN TRANSCARPATHIANS
A. Kuzma *In its* USSR Rept.: Energy (JPRS-UEN-84-038) 28 Dec. 1984 p 129-130 Transl. into ENGLISH from Pravda Ukr. (Kiev), 15 Aug. 1984 p 4 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

The lion's share of the Earth's electric power is known to be produced by thermal electric power plants which burn coal and gas. New storehouses of energy must be sought. It became known that the main reserves of heat in the Earth's interior are concentrated in rock. In simple terms, the technology of delivering the Earth's heat to the surface is as follows: water injected under high pressure from a river into one well comes in contact with hot beds situated at enormous depth, after which it returns by a second well in the form of a steam-water mixture, which then operates turbines of an electric power plant. The water would be used many times over in a closed cycle. This method promises many advantages. It will provide a possibility for generating cheap electric power while excluding all pollution of the environment.
B.G.

N85-16316# Joint Publications Research Service, Arlington, Va.
VERSATILITY OF PEAT EMPHASIZED
I. Lishtvan *In its* USSR Rept.: Energy (JPRS-UEN-84-038) 28 Dec. 1984 p 131-133 Transl. into ENGLISH from Ekon. Gazeta (Moscow), no. 35, Aug. 1984 p 16 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

The use of peat as a source of energy and new products is discussed. B.G.

N85-16317# Joint Publications Research Service, Arlington, Va.
OIL-SHALE EXPLORATION EXPANSION URGED **c43**
M. V. Golitsyn and L. M. Prokofyeva *In its* USSR Rept.: Energy (JPRS-UEN-84-038) 28 Dec. 1984 p 134-138 refs Transl. into ENGLISH from Ugol (Moscow), no. 10, Oct. 1984 p 10-11 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

World consumption of energy resources is increasing each year. The involvement of new sources of energy, one of which is oil shale, in the fuel and power balance will be required. Abroad, oil shale is used mainly for obtaining shale resin (synthetic oil). Industrial shale-refining installations are being erected in the USA, Australia, Brazil and Morocco. However, a highly developed shale industry exists at present only in the USSR and the People's Republic of China. About 100 shale fields and shale shows are known in the USSR. These are concentrated mainly in the country's European portion. Total shale reserves are assessed at 193 billion tons. The main routes for increasing oil-shale resources are as follows: exploration of new areas, the reexamination and reevaluation of known fields, a review of the specifications by way of moderating them, reduction of losses during mining and handling, and the application of new, progressive methods or using shale.
B.G.

N85-16318# Joint Publications Research Service, Arlington, Va.
HELIOSTAT TESTED Abstract Only
In its USSR Rept.: Energy (JPRS-UEN-84-038) 23 Dec. 1984 p 139 Transl. into ENGLISH from Selskaya Zhizn (Moscow), 16 Aug. 1984 p 1 (For primary document see N85-16312 07-44)
Avail: NTIS HC A10

An enormous glint of sunlight darted over gently sloping summits and the hairpin curves of the mountain road. Mirrors concentrated this glint into a single beam, which then shot through a thick sheet of aluminum. Such was the result of the first test run on heliostats of the unique Solntse scientific-production complex being erected in Tashkent Oblast. There will be 62 such heliostats, each with an area of 50 square meters. Hot beams will be transmitted to the concave mirror of a concentrator (2,000 square meters). And the glint that shoots from it effortlessly melts not only aluminum but also almost all known materials. A special melting furnace toward which the concentractor directs hundreds of kilowatts of energy, burns brighter than a thousand suns. The complex presently under construction is intended for acquisition of ultrahigh-heat and concurrently ultrapure materials needed by many industrial sectors. This is extremely difficult to do by traditional chemical methods and even by the most modern methods--ultrahigh frequency and cathode ray methods. Author

N85-15932# Joint Publications Research Service, Arlington, Va.
COMPOSITE BATTERIES Abstract Only
In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-039) 18 Dec. 1984 p 4 Transl. into ENGLISH from Composites et Nouveaux Mater. (Paris), Sep. 1984 p 6 (For primary document see N85-15929 07-31)
Avail: NTIS HC A04/MF A01

N85-16375# Consejo Nacional de Investigaciones Cientificas y Technicas, Buenos Aires (Argentina).
ENERGY AND CLIMATE: PROBLEMS IN LATIN AMERICA
V. Barros *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 394-407 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

45 ENVIRONMENT POLLUTION

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

N85-16319 British Gas Corp., London (England).
NOx EMISSIONS NEAR A HEAT PUMP WITH GAS MOTOR
T. P. M. Hendriks and J. C. Visser 26 Jul. 1984 27 p refs Transl. into ENGLISH from Gas (Netherlands), no. 10, Oct. 1983 p 1-10
(BLL-WH-782-(9091.9F); T6357/BG/WH782/84) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

The area near the installation building of a heat pump driven by a gas motor was studied to determine whether concenirations of combustion gases occur which may have long term harmful effects on public health. In addition, the extent to which the dilution of combustion gases a very short distance from the building can be described by means of currently known air pollution transport models was investigated. At no single measurement point around the heat pump building did nitrogen oxide emission concentrations exceed 25 ppb, the 50-percentile value in the health standards for outside air. R.S.F.

N85-16320*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-41G) LAUNCH
D. L. Johnson, C. K. Hill, G. Jasper, and G. W. Batts (Computer Sciences Corp., Huntsville, Ala.) Nov. 1984 42 p refs
(NASA-TM-86486; NAS 1.15:86486) Avail: NTIS HC A03/MF A01 CSCL 13B

Selected atmospheric conditions that were observed near Space Shuttle STS-41G launch time on October 5, 1984 at Kennedy Space Center in Florida are summarized. Values of ambient pressure, temperature, moisture, ground winds, visual obsrvations (cloud), and winds aloft are included. The sequence of prelaunch Jimsphere-measured vertical wind profiles is given. The final atmospheric tape consisting of wind and thermodynamic parameters versus altitude for STS-41G vehicle ascent was constructed. The STS-41G ascent atmospheric data tape was constructed. The STS-41G ascent atmospheric data tape was constructed by Marshall Space Flight Center's Atmospheric Sciences Division to provide an internally consistent data set for use in post flight performance assessments. Author

N85-16321# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
FATE AND DISPOSITION OF TRICHLOROETHYLENE IN SURFACE SOILS Ph.D. Thesis
Thomas Joseph Walker 1984 370 p
(AD-A147918; AFIT/CI/NR-84-92D) Avail: NTIS HC A16/MF A01 CSCL 13/2

Trichloroethylene (TCE) is a widely detected contaminant in groundwater. This study investigated fate of TCE in two similar soils with differing organic carbon contents. TCE was applied to soil columns in one 5 or 10 ml quantity, then eluted with 50 or 100 ml of water/day. The 1.4% organic carbon soil retarded TCE elution more than did the 0.53% soil. Biodegradation of TCE in the soils, based on effluent TCE and chlorides, was not enhanced by addition of ammonia. Warburg studies showed TCE inhibited biological activity in unacclimated soil. Acclimated soil of both types from 2.5 and 15 inch depths showed degradation of TCE at 55 mg/1 but not 110 or 550 mg/1. No evidence of cis or trans-1,2-dichloroethylene was found in column effluents. Degradation (biological and abiotic) accounted for 0.3% or less of TCE. Volatilization accounted for 15.6-32.8% of TCE applied. GRA

N85-16322# Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H., Vienna. Inst. fuer Chemie.
IMMOBILIZATION OF TOXIC WASTE BY EMBEDDING IT IN BITUMEN
Karl Knotik and Walter Winkelhofer (Vereinigte Edelstahlwerke AG) Apr. 1984 22 p refs In GERMAN; ENGLISH summary Sponsored by Gewerblichen Wirtschaft Submitted for publication
(OEFZS-4277; CH-331/84) Avail: NTIS HC A02/MF A01

A drying and bituminization plant for the treatment of hazardous waste is described. It operates on the basis of a noncontaminative vacuum sedimentation process. The drying and embedding phases are separated. The sedimentation process can also be used for the embedding of all types of solid, granular wastes (vacuum-impregnation) and for the conditioning of spent ion exchange resins. Author (ESA)

N85-16374# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
ECOLOGICAL IMPACTS OF HYDROELECTRIC PROJECTS IN AMAZONIA
Jesus Marden dosSantos *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 379-393 (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

46 GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

For space radiation see *93 Space Radiation.*

N85-16323*# State Univ. of New York, Albany.
SYNTHESIS OF PROTEROZOIC DATA AS A PREREQUISITE FOR TECTONIC AND THERMAL MODELING Final Technical Report, 1 Apr. 1983 - 31 Mar. 1984

Kevin C. Burke 31 Mar. 1984 71 p refs
(Grant NAGw-489)
(NASA-CR-174252; NAS 1.26:174252) Avail: NTIS HC A03/MF A01 CSCL 08G

Rocks of the Pongola supergroup form an elongate belt in the Archean Kaapvaal Caton of southern Africa. Because these rocks exhibit many features that are characteristic of rocks deposited in continental rifts, it is suggested that the Pongola supergroup was deposited in such a rift. The age of these rocks (approximately 3.0 Ga) makes the Pongola structure the world's oldest well-preserved rift so far recognized, and comparison of the Pongola Rift with other rifts formed more recently in Earth history reveals striking similarities. Rocks of the Ventersdorp Supergroup were deposited in a system of northeast trending grabens on the Kaapvaal Craton approximately 2.64 Ga ago. It is suggested that it was this collision which initiated the Ventersdorp rifting. The Ventersdorp rift province is related to an extension in the Kaapval Craton associated with the collision. R.S.F.

N85-16324# Commonwealth Scientific and Industrial Research Organization, Mordialoc (Australia). Div. of Atmospheric Research.
THE CSIRO (AUSTRALIA) ATMOSPHERIC CARBON DIOXIDE MONITORING PROGRAM: SURFACE DATA
D. J. Beardsmore, G. I. Pearman, and C. OBrien 1984 120 p refs
(CSIRO-TP-6) Avail: NTIS HC A06/MF A01

The Commonwealth Scientific and Industrial Research Organization (CSIRO) surface carbon dioxide monitoring programs at the Australian BAPMoN station at Cape Grim in Tasmania, the subAntarctic station at Macquarie Island, Mawson on the Antarctic mainland, Wilbinga in Western Australia, and from ships in the Southern Ocean are described. Background composition of the atmosphere was studied. The techniques and data handling procedures for the surface observation program, summary data, and the complete archived data sets are described. It is concluded that the present concept is a satisfactory basis on which to provide data for use in the global carbon cycle context. E.A.K.

N85-16325*# New Technology, Inc., Huntsville, Ala.
ATMOSPHERIC MODELING AND SENSOR SIMULATION (AMASS) STUDY Final Report
K. G. Parker 12 Oct. 1984 36 p
(Contract NAS8-35189)
(NASA-CR-171283; NAS 1.26:171283; FR1021) Avail: NTIS HC A03/MF A01 CSCL 04A

The capabilities of the atmospheric modeling and sensor simulation (AMASS) system were studied in order to enhance them. This system is used in processing atmospheric measurements which are utilized in the evaluation of sensor performance, conducting design-concept simulation studies, and also in the modeling of the physical and dynamical nature of atmospheric processes. The study tasks proposed in order to both enhance the AMASS system utilization and to integrate the AMASS system with other existing equipment to facilitate the analysis of data for modeling and image processing are enumerated. The following array processors were evaluated for anticipated effectiveness and/or improvements in throughput by attachment of the device to the P-e: (1) Floating Point Systems AP-120B; (2) Floating Point Systems 5000; (3) CSP, Inc. MAP-400; (4) Analogic AP500; (5) Numerix MARS-432; and (6) Star Technologies, Inc. ST-100. R.S.F.

N85-16326# Royal Norwegian Council for Scientific and Industrial Research, Kjeller.
[RESEARCH ACTIVITIES OF THE NORWEGIAN SEISMIC ARRAY (NORSAR)] Semiannual Technical Summary Report, 1 Oct. 1983 - 31 Mar. 1984
L. B. Tronrud May 1984 81 p
(AD-A146778; NORSAR-Scientific-2-83/84) Avail: NTIS HC A05/MF A01 CSCL 17/10

This report describes the operation, maintenance and research activities at the Norwegian Seismic Array (NORSAR) for the period 1 October 1983 to 31 March 1984. During this reporting period the replacement of the old IBM processing system has been completed. The newest addition was a system printer replacing two system printers in the old computer system. A new graphic software package, GPGS, was installed during this reporting period to increase flexibility and quality of graphic representation at NORSAR. GRA

N85-16327# National Oceanic and Atmospheric Administration, Oak Ridge, Tenn. Atmospheric Turbulence and Diffusion Div.
DECIDUOUS FOREST RADIATION REGIMES: EFFECTS OF FOREST STRUCTURE, PHENOLOGY AND EARTH-SUN GEOMETRY UPON THEIR SPATIAL, TEMPORAL AND SPECTRAL VARIABILITY Final Report, 1 Jul. 1981 - 30 Jun. 1984
D. D. Baldocchi, B. A. Hutchison, and D. R. Matt Jul. 1984 46 p
(Contract MIPR-ARO-115-84)
(AD-A146804; ARO-17692.3-GS) Avail: NTIS HC A03/MF A01 CSCL 04/1

This report summarizes a research effort to quantify the spatial and temporal variations of solar radiation within a deciduous forest canopy and to test whether canopy radiation transfer models, based on the assumption of spatial homogeneity, are applicable in a deciduous forest stand. The specific objectives of this effort were to: (1) Quantify the incoming and outgoing fluxes of solar and terrestrial radiation and evaluate their spatial and temporal variations; (2) Relate these flux measurements and their variabilities to phenological changes in forest structure and to seasonal changes to earth-sun geometry; and (3) Test selected canopy radiation transfer or phytoactinometric models against data observed in and above a deciduous forest. GRA

N85-16328# Naval Research Lab., Washington, D. C.
THE ROLE OF FINITE PARALLEL LENGTH ON THE STABILITY OF BARIUM CLOUDS Memorandum Report, Oct. 1983 - Oct. 1984
J. L. Sperling (JAYCOR, San Diego, Calif.), J. F. Drake (Science Applications, Inc., McClean, Va.) , S. T. Zalesak, and J. D. Huba 8 Nov. 1984 44 p
(AD-A146972; NRL-MR-5436) Avail: NTIS HC A03/MF A01 CSCL 04/1

A simple model is used to show that the finite parallel length of ionospheric plasma clouds can affect the growth rate of striation instabilities (e.g., gradient drift). The finite parallel length of plasma clouds tends to favor the growth of striations with short perpendicular wavelengths. Author (GRA)

N85-16329# Rockwell International Science Center, Thousand Oaks, Calif. Science Center.
NONLINEAR WAVE PROPAGATION STUDY Semiannual Technical Report, 1 Dec. 1983 - 31 May 1984
B. R. Tittmann 31 May 1984 21 p
(Contract F49620-83-C-0065; DARPA Order 4400)
(AD-A147011; SC5261.6SAR; AFOSR-84-0878TR; STR-2) Avail: NTIS HC A02/MF A01 CSCL 08/11

At the present time there still exists an element of uncertainty regarding the definition of an effective radius, which can be used to separate the nonlinear near-field regime adjacent to an explosion from the linear far-field seismic regime. This report presents results of a study of the response of Westerly granite to sinusoidal loading. The amplitude of transition from linearity to non-linearity can be defined. Results are compared to previous studies. Nonlinear effects were observed in a cylindrical test specimen of Westerly granite which was subjected to both flexural and torsional modes of resonant vibration. Nonlinear effects in shear are observed when the shearing strain exceeds approximately 0.000001, increasing slightly with increasing effective pressure. Nonlinear effects in flexure are also observed when the extension/compression strain exceeds 0.000001, also increasing very slightly with increasing effective pressure. These transition amplitudes probably represent a lower limit on the amplitude of transition from linear to nonlinear behavior for the primary elastic pulse propagating in the near-field of an explosion. Using these measurements it is not possible to determine whether the nonlinear effects observed in flexure are

primarily an extensional or compressional feature. This is a critical issue and in future studies we will attempt to examine the constitutive properties of rocks in both tension and compression under moderate to low amplitude conditions. GRA

N85-16330# Royal Norwegian Council for Scientific and Industrial Research, Kjeller.
DEPLOYMENT OF A REGIONAL ARRAY IN NORWAY Semiannual Technical Report, 1 Jan. - 30 Jun. 1984
S. Mykkeltveit 31 Jul. 1984 17 p
(Contract F49620-84-C-0013; ARPA Order 4950; AF Proj. 2309) (AD-A147032; AFOSR-84-0908TR) Avail: NTIS HC A02/MF A01 CSCL 08/11

The purpose of the development of an experimental regional array in Norway is to take advantage of the extremely good propagation of high-frequency energy for regional seismic phases in Eurasia. Since Norway is located within the same geologic plate boundary as the Soviet Union, the deployment of such an array in Norway will provide important new insight with respect to the projected performance of possible future in-country stations in the U.S.S.R. GRA

N85-16331# Rondout Associates, Inc., Stone Ridge, N.Y.
SHORT PERIOD GUIDED WAVES OVER OCEANIC AND CONTINENTAL PATHS Quarterly Research and Development Status Report, 1 Apr. - 31 Jul. 1984
P. W. Pomeroy and G. H. Sutton 31 Jul. 1984 7 p
(Contract F49620-83-C-0017; ARPA Order 4493; AF Proj. 2309) (AD-A147053; AFOSR-84-0907TR; QRDSR-7) Avail: NTIS HC A02/MF A01 CSCL 08/11

Task A: (1) Evaluate the usefulness of Pg and Lg to estimate yield for Eurasian and Africa events, (2) Investigate possible caused of amplitude variation (i.e., source and recording site geology), and (3) Analyze the regional phases for use in discrimination and yield estimation; Task B: (1) Continue the analysis of data from Wake Island Hydrophone Array in cooperation with personnel at Hawaii Inst. of Geophysics and assist in guiding the operation of the array, (2) Conduct comparative studies of (long-range) oceanic Pn/Sn and continental Lg (Pg) using, especially, data from the Catskill Seismic Array and the Wake Array, in comparison with theoretical seismograms for different source types, focal depth, and velocity structures, and (3) Evaluate the Wake and Catskill Arrays in terms of signal coherence and detection capability, also compare them with other high quality continental stations and the DARPA/NORDA MSS; Task C: (1) Install, maintain, and operate high quality three component broad band digital seismographs in the Stone Ridge, NY area, and (2) Development analysis techniques and software to obtain source and propagation path characteristics from broad band three component digital data. GRA

N85-16332# Air Force Geophysics Lab., Hanscom AFB, Mass.
C2 SUB n (OPTICAL) STUDIES IN THE FREE ATMOSPHERE BASED ON RAWINSONDE DATA Final Scientific Report, 1 Oct. 1982 - 30 Sep. 1984
E. A. Murphy, F. P. Battles, K. G. Scharr, and J. R. McCormack 26 Apr. 1984 42 p
(DA Proj. 7670)
(AD-A147307; AFGL-TR-84-0135; AFGL-ERP-878) Avail: NTIS HC A03/MF A01 CSCL 04/1

Rawinsonde data from several locations in the United States are used to obtain free atmosphere estimates of C2 sub n (optical), the index of refraction structure parameter. Wind and temperature data are used to calculate N, the square of the Brunt-Vaisalla frequency, S, the wind shear squared term, and the Richardson number at kilometer intervals from 1 km to 25 km. These quantities are inputs to the Van Zandt model to determine C2 sub n. Also, the rms wind speed (u), obtained from the rawinsonde data, is used as input to the Hufnagel model to obtain C2 sub n. Aspects of the C2 sub n models are discussed and comparisons are made using model results and C2 sub n radar measurements. Statistical analysis of results indicate significant differences in media C2 sub n distributions for both season and latitude. Coherence lengths (r sub o) for plane wave propagation down through the atmosphere are estimated and dropoff rates of C sub n squared in dB/km are calculated from 15 km to 25 km. Author (GRA)

N85-16333# Birmingham Univ. (England).
IONIC REACTIONS OF ATMOSPHERIC IMPORTANCE Interim Scientific Report, 1 Feb. 1982 - 30 Jun. 1984
D. Smith and N. Adams 31 Aug. 1984 127 p Sponsored by AFOSR and European Office of Aerospace Research and Development
(AF Proj. 2302; AF Proj. 2303)
(AD-A147354; AFGL-TR-84-0289; AFOSR-82-0095A; ISR-1) Avail: NTIS HC A07/MF A01 CSCL 04/1

A variable-temperature flowing afterglow/Langmuir probe (VT-FALP) apparatus has been used to study several electron-ion dissociative recombination reactions and several electron attachment reactions. Thus the variation with temperature of the respective dissociative recombination coefficients, alpha and electron attachment coefficients, beta have been determined. The recombination studies have included the species O2+, NO+, NH4+, H3, HCO+, N2H+ and CH5+, and the attachment studies have included the species CC14, CC13F, CC12F2, CHC13, C12, SF6, C-C7F14, CH3Br, CF3Br, CH2Br2 and CH3I. Some ion molecule reactions have also been studied as a function of temperature and of ion-molecule center-of mass energy using a variable-temperature selective ion flow drift tube (VT-SIFDT). GRA

N85-16334# Ford Aerospace and Communications Corp., Newport Beach, Calif. Aeronutronic Div.
CONTINUUM ABSORPTION BY H2O IN THE 700-1200 cm(-1) AND 2400-280 cm(-1) WINDOWS
D. E. Burch and R. L. Alt Hanscom AFB, Mass. AFGL May 1984 34 p
(Contract F19628-81-C-0188)
(AD-A147391; U-6794; AFGL-TR-84-0128; SR-1) Avail: NTIS HC A03/MF A01 CSCL 04/1

New laboratory measurements have been made of the H2O continuum absorption at several wavenumbers within the 700-1200 cm-1 and 2400-2800 cm-1 regions. Samples of both pure H2O and H2O + N2 have been studied in a multiple-pass absorption cell at path lengths up to more than 800 meters. Data for samples of pure H2O at reduced temperatures (284 K) indicate that the self-broadening coefficients increase with decreasing temperature at about the rate predicted by extrapolating from previous data on samples at elevated temperatures. Coefficients for N2 broadening have been measured in both windows, and the results compared with previous work. The results have been compared with the data base for the well-known transmission computer code LOWTRAN 6. Author (GRA)

N85-16335# Naval Research Lab., Washington, D. C.
REGION 1 BIRKELAND CURRENTS FROM A GLOBAL MHD SIMULATION OF THE MAGNETOSPHERE Memorandum Report, Oct. 1984 - Oct. 1985
J. A. Fedder and J. G. Lyon 28 Sep. 1984 31 p
(RR0-3302; W15-494)
(AD-A147435; NRL-MR-5397) Avail: NTIS HC A03/MF A01 CSCL 04/1

The study of large scale geomagnetic field aligned currents, which couple the dynamics of the magnetosphere and the high latitude ionosphere, has been an area of intense research interest in recent years. These currents, first postulated by Birkeland (1908) to be responsible for geomagnetic activity and auroral phenomena in the polar regions, were first observed in the 1970's by Arnoldy, Zmuda and Armstrong and Sugiura and have now been extensively measured and documented by satellite and rocket magnetometers. The large scale Birkeland currents are observed in two rings which encircle the polar regions. The poleward ring has been called the Region 1 system and the equatorward ring the Region 2 system. Global numerical MHD simulation data for the Earth's magnetosphere has been used to calculate Birkeland current systems in the polar ionosphere. In this report, we show the results for the Region 1 Birkeland currents. We demonstrate how the currents are organized on open or closed field lines in daytime and nighttime

sectors. The current source regions are identified and driving mechanisms are discussed. GRA

N85-16336# Massachusetts Univ., Amherst. Astronomy Research Facility.
STUDY OF INFRARED ATMOSPHERIC EMISSION Final Report, 2 Oct. 1980 - 31 Dec. 1983
H. Sakai Dec. 1983 110 p
(Contract F19628-81-K-0007)
(AD-A147517; UMASS-ARF-83-333; AFGL-TR-84-0006) Avail: NTIS HC A06/MF A01 CSCL 17/5

The effort made for this study contract is grouped into two major categories: (1) Experimental and theoretical study of the infrared emission generated in a low pressure gaseous glow discharge, and (2) Processing of SCRIBE (Stratospheric Cryogenic Interferometer Balloon Experiment) data. GRA

N85-16337# Naval Research Lab., Washington, D. C.
IONOSPHERIC TURBULENCE: INTERCHANGE INSTABILITIES AND CHAOTIC FLUID BEHAVIOR Memorandum Report, Oct. 1983 - Oct. 1984
J. D. Huba, A. B. Hassam, I. B. Schwartz, and M. J. Keskinen 22 Nov. 1984 26 p
(AD-A147810; NRL-MR-5474) Avail: NTIS HC A03/MF A01 CSCL 04/1

We develop a set of mode coupling equations which describe the nonlinear evolution of the Rayleigh-Taylor and E X B gradient drift instabilities which are relevant to the ionosphere. The model is restricted to 2D turbulence in the plane transverse to the magnetic field, and only those modes such that $kL >> 1$ are considered, where k is the wavenumber and L is the scale length of the density gradient. We show that for a three mode system, the nonlinear equations describing these instabilities correspond exactly to the Lorenz equations which approximately describe the Rayleigh-Bernard instability. Following the analysis of Lorenz (1963), it is shown that the three mode system can exhibit a strange attractor with chaotic behavior. Ion inertia plays a critical role in this phenomenon in that if it is neglected (as in the collisional limit), the three mode system does not exhibit chaos and a stable convection pattern results. GRA

N85-16338# Naval Weapons Center, China Lake, Calif.
COSO MONITORING PROGRAM, JANUARY 1981 THROUGH DECEMBER 1983 Summary Report, Jan. 1981 - Dec. 1983
S. C. Bjornstad and C. R. Rodgers Sep. 1984 212 p
(AD-A147894; NWC-TP-6558) Avail: NTIS HC A10/MF A01 CSCL 08/8

The Coso monitoring program is a continuing effort in support of the development of the Navy's geothermal resources within the Coso Known Geothermal Resource Area (KGRA). Data are presented on the monitoring of steam flow rates and temperatures, water levels in ponds and wells, water chemistry, temperature logs of shallow wells, and rainfall in the Coso Hot Springs Resort area. A weekly photographic essay of the mud pots and pools shows the variation of surface water levels thoughout the year. Author (GRA)

N85-16339# Aerospace Corp., El Segundo, Calif. Space Sciences Lab.
EARTH'S RADIATION BELTS
M. Schulz 28 Sep. 1984 46 p
(Contract F04701-83-C-0084)
(AD-A147927; TR-0084(4940-06)-4; SD-TR-84-50) Avail: NTIS HC A03/MF A01 CSCL 04/1

This report reviews the status of radiation-belt science at the close of the data-acquisition phase (1976-79) of the International Magnetospheric Study (IMS). The purpose is to place recent discoveries in context with respect to long-standing problems, and to indicate possible directions for future research in radiation-belt physics. The review includes a synopsis of results achieved on topics related to the source, energization, transport, and loss processes that affect geomagnetically trapped radiation, as well as results concerning certain subtle consequences of adiabatic charged-particle motion. Major areas of interest include the effects of charge exchange and radial transport on the ion composition of the ring current and radiation belts, the measurement of ion distributions in all three dimensions of velocity space, and the evolution of radiation-belt particle intensities as a consequence of temporal variations of transport coefficients and boundary conditions over the solar cycle and over the course of a magnetic storm. Moreover, the realization is developing that the major uncertainties in radiation-belt physics lie beyond the radiation belts themselves. GRA

N85-16340# Research Inst. of National Defence, Stockholm (Sweden). Dept. 2.
SEISMICITY OF SOUTHERN SWEDEN
Ragnar Slunga, Peter Norrman, and Ann-Christine Glans Jul. 1983 108 p refs Sponsored by Swedish Nuclear Power Inspectorate (SKI) and Swedish National Board for Spent Nuclear Fuel (NAK)
(FOA-C-20543-T1; ISSN-0347-3694) Avail: NTIS HC A06/MF A01

The statistics of more than 150 Swedish earthquakes were analyzed. The analysis includes epicenter and focal depth determination, fault plane solution, estimates of seismic moment, corner frequencies, stress drops, and peak ground motions. A seismic hazard study illustrating how the knowledge of the earthquake ground motions can be used is presented. The analysis shows that the earthquakes are due to a NW-SE compression of the crust. The Protogene zone delimits the higher activity to the west from the lower activity in the older eastern crust. The existing fault pattern determines the type of faulting. Active faults can be traced on the surface. Thus close relations between geology and seismicity are indicated. Author (ESA)

N85-16341# Intermountain Forest and Range Experiment Station, Ogden, Utah.
COMPUTER PROGRAM TO COMPUTE SOIL THERMAL CONDUCTIVITY FROM TRANSIENT TEMPERATURE MEASUREMENTS
F. A. Albini 1984 13 p refs
(PB85-100550) Avail: NTIS HC A02/MF A01 CSCL 08M

A computer program written in FORTRAN 77 was developed to compute the thermal conductivity of soil from parameters obtained from a cylindrical probe. The probe was heated externally prior to insertion in the soil. Parameters necessary for the computation are the physical and thermal properties of the probe, the volumetric heat capacity of the soil, an estimate of the soil emperature, the initial probe temperature, and the declining temperature of the probe overtime. GRA

N85-16230# Joint Publications Research Service, Arlington, Va.
KHIBINY EXPERIMENT DESCRIBED
Ye. P. Velikhov, A. A. Zhamaletdinov, and M. S. Zhdanov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 44-53 Transl. into ENGLISH from Zemlya i Vselennaya (Moscow), no. 5, Sep. - Oct. 1984 p 12-19 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16231# Joint Publications Research Service, Arlington, Va.
MICROSEISM LEVEL, TIME VARIATIONS AT TURKMEN SEISMIC STATIONS STUDIED
B. S. Karryyev *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 71-76 refs Transl. into ENGLISH from Izv. Akad. Nauk Turkm. SSR: Ser. Fiz.-Tekh. Khim. i Geol. Nauk (Ashkhabad, USSR), no. 1, 1984 p 77-81 (For primary document see N85-16223 07-42)
Avail: NTIS HC 06

N85-16232# Joint Publications Research Service, Arlington, Va.
GENERAL MODEL OF EARTHQUAKES AND THE PLACE OF WARNINGS IN IT
O. A. Odekov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 77-85 refs Transl. into ENGLISH from Izv. Akad. Nauk Turkm. SSR: Ser. Fiz.-Tekh. Khim. i Geol. Nauk

(Ashkhabad, USSR), no. 1 1984 p 64-70 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16233# Joint Publications Research Service, Arlington, Va.
EARTHQUAKE FORECASTING RESEARCH IN THE UKRAINE
V. V. Kutas and G. Ye. Kharechko *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 87-90 Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 2, Feb. 1984 p 105-107 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16235# Joint Publications Research Service, Arlington, Va.
DEEP STRUCTURE OF WESTERN SIBERIA Abstract Only
Ye. V. Karus, G. A. Gabrielyants, V. M. Kovylin, and N. M. Chernyshev *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 92 Transl. into ENGLISH from Sov. Geol. (Moscow), no. 5, May 1984 p 75-85 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16236# Joint Publications Research Service, Arlington, Va.
MODEL OF EARTHQUAKE MECHANISM Abstract Only
A. I. Dobrolyubov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 92-93 Transl. into Akad Nauk BSSR (Minsk), v. 28, no. 6, Jun. 1984 p 550-553 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16237# Joint Publications Research Service, Arlington, Va.
STATISTICAL FILTERING AS METHOD FOR DETECTING TRANSCRUSTAL ACOUSTIC ANOMALIES Abstract Only
Yu. P. Orovetskiy and L. M. Yavlochkina *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 93-94 Transl. into ENGLISH from Dokl. Akad. Nauk Ukr. SSR, Ser. B: Geol. Khim. i Biol. Nauk. (Kiev), no. 4, Apr. 1984 p 17-20 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

47 METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N85-16342 Department of the Air Force, Washington, D.C.
RAIN RATE METER Patent
V. G. Plank, S. D. Crist, and D. I. LaGross, inventors (to Air Force) Issued 16 Oct. 1984 8 p Supersedes AD-D010598 (AD-D011381; US-Patent-4,476,718; US-Patent-Appl-SN-482754; US-Patent-Class-73-171) Avail: US Patent and Trademark Office CSCL 04/2

A rain rate meter for delineating short-term variations in rain rate having a housing which encloses an electronic balance sensitive to approximately 0.01 grams is described. The top of the housing is open and has a funnel-shaped element located therein for receiving rainfall. An outlet port is centrally located at the bottom of the funnel-shaped element and a dispersing means is positioned adjacent the outlet port for substantially eliminating the adverse effects of the downward momentum of the rain water flowing from the outlet port prior to being collected by a container which rests upon the balance in the housing. A transfer mechanism is situated in the container in order to gently deposit the flowing rain water into the container. Measurements of collected rainfall weight are made over a preselected period of time by the electronic balance in order to accurately ascertain rain rate.
Author (GRA)

N85-16343*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
INTERNATIONAL AEROSPACE AND GROUND CONFERENCE ON LIGHTNING AND STATIC ELECTRICITY. 1984 TECHNICAL PAPERS. SUPPLEMENT
Washington Dec. 1984 65 p refs Conf. held in Orlando, Fla., 26-28 Jun. 1984; sponsored in cooperation with NASA, Army, Navy, AF, DOT, Florida Inst. of Tech., IEEE, Society of Automotive Engineers, United Kingdom Civil Aviation Authority, United Kingdom Royal Aircraft Establishment, and Culham Lab.
(NASA-CP-2356; L-15910; NAS 1.55:2356; NADC-84104-20-Suppl) Avail: NTIS HC A04/MF A01 CSCL 04B

The indirect effects of lightning on digital systems, ground system protection, and the corrosion properties of conductive materials are addressed. The responses of a UH-60A helicopter and tactical shelters to lightning and nuclear electromagnetic pulses are discussed. For individual titles, see N85-16344 through N85-16350.

N85-16344*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
UPSET SUSCEPTIBILITY STUDY EMPLOYING CIRCUIT ANALYSIS AND DIGITAL SIMULATION c32
Victor A. Carreno *In its* Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 14 p refs Previously announced as N84-27374 (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

An approach to predict the susceptibility of digital systems to signal disturbances is described. Electrical disturbances on a digital system's input and output lines can be induced by activities and conditions including static electricity, lightning discharge, electromagnetic interference (EMI), and electromagnetic pulsation (EMP). The electrical signal disturbances employed for the susceptibility study were limited to nondestructive levels, i.e., the system does not sustain partial or total physical damage and reset and/or reload brings the system to an operational status. The front-end transition from the electrical disturbances to the equivalent digital signals was accomplished by computer-aided circuit analysis. The supersceptre (system for circuit evaluation of transient radiation effects) programs was used. Gate models were developed according to manufacturers' performance specifications and parameters resulting from construction processes characteristic of the technology. Digital simulation at the gate and functional level was employed to determine the impact of the abnormal signals on system performance and to study the propagation characteristics of these signals through the system architecture. Example results are included for an Intel 8080 processor configuration. Author

N85-16345*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DATA AND RESULTS OF A LABORATORY INVESTIGATION OF MICROPROCESSOR UPSET CAUSED BY SIMULATED LIGHTNING-INDUCED ANALOG TRANSIENTS c32
Celeste M. Belcastro *In its* Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 12 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

Advanced composite aircraft designs include fault-tolerant computer-based digital control systems with thigh reliability requirements for adverse as well as optimum operating environments. Since aircraft penetrate intense electromagnetic fields during thunderstorms, onboard computer systems maya be subjected to field-induced transient voltages and currents resulting in functional error modes which are collectively referred to as digital system upset. A methodology was developed for assessing the upset susceptibility of a computer system onboard an aircraft flying through a lightning environment. Upset error modes in a general-purpose microprocessor were studied via tests which involved the random input of analog transients which model lightning-induced signals onto interface lines of an 8080-based microcomputer from which upset error data were recorded. The application of Markov modeling to upset susceptibility estimation is discussed and a stochastic model development. R.S.F.

N85-16346*# Air Force Eastern Test Range, Patrick AFB, Fla.
LIGHTNING RESEARCH: A USER'S LAMENT
Cyril N. Golub *In* NASA. Langley Research Center Intern.

Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 6 p ref (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 04B

As a user of devices and procedures for lightning protection, the author is asking the lightning research community for cookbook recipes to help him solve his problems. He is lamenting that realistic devices are scarce and that his mission does not allow him the time nor the wherewithal to bridge the gap between research and applications. A few case histories are presented. In return for their help he is offering researchers a key to lightning technology--the use of the Eastern Test Range and its extensive resources as a proving ground for their experiment in the lightning capital of the United States. A current example is given--a joint lightning characterization project to take place there. Typical resources are listed. Author

N85-16347*# General Semiconductor Industries, Inc., Tempe, Ariz.
THE ac POWER LINE PROTECTION FOR AN IEEE 587 CLASS B ENVIRONMENT c33
William D. Roehr and O. Melville Clark *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 5 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 09A

The 587B series of protectors are unique, low clamping voltage transient suppressors to protect ac-powered equipment from the 6000V peak open-circuit voltage and 3000A short circuit current as defined in IEEE standard 587 for Category B transients. The devices, which incorporate multiple-stage solid-state protector components, were specifically designed to operate under multiple exposures to maximum threat levels in this severe environment. The output voltage peaks are limited to 350V under maximum threat conditions for a 120V ac power line, thus providing adequate protection to vulnerable electronic equipment. The principle of operation and test performance data is discussed. Author

N85-16348*# Boeing Aerospace Co., Seattle, Wash.
CORROSION PROPERTIES OF SECOND-GENERATION CONDUCTIVE MATERIALS c27
Earl Groshart *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 7 p (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 11B

Since the introduction of silver-filled epoxy adhesives and silver-filled nitrocellulose lacquer as RFI control materials, a number of new materials have been introduced. The resin carriers have been changed in an effort to make the materials more usable or more EPA acceptable and the fillers have been varied in an effort to make the materials less costly. The corrosion-related properties of second-generation materials were assessed, including adhesives, caulks, and greases. Aluminum 2024 was used as the only substrate material. Ten days of salt fog was used as the corrosive environment. If a noble material such as silver, nickel, or carbon is sandwiched with aluminum an increase in dc resistance results given enough time. If this is unsatisfactory electrically it should either not be used or have all corrosive environments excluded. R.S.F.

N85-16349*# Electro Magnetic Applications, Inc., Denver, Colo.
A COMPARISON OF LIGHTNING AND NUCLEAR ELECTROMAGNETIC PULSE RESPONSE OF A HELICOPTER c32
C. C. Easterbrook and R. A. Perala *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 7 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

A numerical modeling technique is utilized to investigate the response of a UH-60A helicopter to both lightning and nuclear electromagnetic pulses (NEMP). The analytical approach involves the three-dimensional time domain finite-difference solutions of Maxwell's equations. Both the external currents and charges as well as the internal electromagnetic fields and cable responses are computed. Results of the analysis indicate that, in general, the short circuit current on internal cables is larger for lightning, whereas the open-circuit voltages are slightly higher for NEMP. The lightning response is highly dependent upon the rise time of the injected current as was expected. The analysis shows that a coupling levels to cables in a helicopter are 20 to 30 dB larger than those observed in fixed-wing aircraft. Author

N85-16350*# Electro Magnetic Applications, Inc., Denver, Colo.
A COMPARISON OF LIGHTNING AND NUCLEAR ELECTROMAGNETIC PULSE RESPONSE OF TACTICAL SHELTERS c32
R. A. Perala, T. H. Rudolph, and P. M. McKenna *In* NASA. Langley Research Center Intern. Aerospace and Ground Conf. on Lightning and Static Elec. Dec. 1984 12 p refs (For primary document see N85-16343 07-47)
Avail: NTIS HC A04/MF A01 CSCL 20N

The internal response (electromagnetic fields and cable responses) of tactical shelters is addressed. Tactical shelters are usually well-shielded systems. Apart from penetrations by signal and power lines, the main leakage paths to the interior are via seams and the environment control unit (ECU) honeycomb filter. The time domain in three-dimensional finite-difference technique is employed to determine the external and internal coupling to a shelter excited by nuclear electromagnetic pulses (NEMP) and attached lightning. The responses of interest are the internal electromagnetic fields and the voltage, current, power, and energy coupled to internal cables. Leakage through the seams and ECU filter is accomplished by their transfer impedances which relate internal electric fields to external current densities. Transfer impedances which were experimentally measured are used in the analysis. The internal numerical results are favorably compared to actual shelter test data under simulated NEMP illumination. R.S.F.

N85-16351*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AN EVALUATION AND COMPARISON OF VERTICAL PROFILE DATA FROM THE VISSR ATMOSPHERIC SOUNDER (VAS)
Gary J. Jedlovec Washington Jan. 1985 40 p refs
(NASA-TP-2425; NAS 1.60:2425) Avail: NTIS HC A03/MF A01 CSCL 04B

A statistical evaluation is used to compared vertical profiles of temperature and moisture derived from VISSR Atmospheric Sounder (VAS) with three different algorithms to that of corresponding rawinsonde measurements for a clear cold environment. To account for time and space discrepancies between the data sets, rawinsonde data were adjusted to be representative of the satellite sounding times. Both rawinsonde and satellite sounding data were objectively analyzed onto a mesoscale grid. These grid point values were compared at 50 mb pressure increments from the surface up to 100 mb. The data were analyed for horizontal and vertical structure, representatives of derived parameters, and significant departure (improvement) from the apriori (first guess) information. Results indicate some rather strong temperature and moisture biases exist in the satellite soundings. Temperature biases of 1 to 4 C and dewpoint biases of 2 to 6 C generally occur in layers where strong inversions are present and vary with time as these atmospheric features evolve. The biases also changes as a function retrieval scheme suggesting limitations and restrictions on the applications of the various techniques. Standard temperature deviations range from 1 to 2 C for each retrieval scheme with maximum values around 800 and 400 mb. Derived parameters (precipitable water and thickness) suffer from similar biases, though to a somewhat lesser extent. Gradients of basic and derived parameters are generally weaker but have good horizontal structure where magnitudes of the parameters are relatively strong. Integrated thermal (temperature) and moisture (precipitable water) parameters show mixed results. B.W.

N85-16352# World Meteorological Organization, Geneva (Switzerland).
CLIMATE CONFERENCE FOR LATIN AMERICA AND THE CARIBBEAN
1984 515 p refs Partly in ENGLISH ans SPANISH Conf. held at Paipa, Columbia, 28 Nov. - 3 Dec. 1983 Original contains

color illustrations
(WMO-632; ISBN-92-63-00632-6) Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The regional climate of Latin America and the Caribbean and its interactions with socioeconomic factors were discussed. Climate data management, international cooperation and participation of the various nations in the World Climate Program were considered. For individual titles, see N85-16353 through N85-16382.

N85-16353# Princeton Univ., N. J.
THE PROBLEM OF CLIMATE AND CLIMATE VARIATION
Joseph Smagorinsky *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 64-76 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Developments leading to the present theoretical understanding of climate are outlined. The question of predictability is discussed using as an example the dependence of atmospheric response on surface sea temperature. Progress in the prediction of carbon dioxide induced changes and of monthly to interannual variability is described. The promising link between episodes of El Nino and long term events in the atmosphere is discussed. It is shown that an identifiable sequence of events in the ocean and in the atmosphere can be traced with consistency for as far back as 2 yr. Author (ESA)

N85-16354# World Meteorological Organization, Geneva (Switzerland).
REVIEW OF CLIMATE PROBLEMS IN LATIN AMERICA AND THE CARIBBEAN
Luiz Gylvan Meiro Filho *In its* Climate Conf. for Latin America and the Caribbean 1984 p 77-81 (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The importance of interannual climatic variations to the economy of the region is discussed. Examples of the most important problems are examined, including crop yields, water resources, long range weather forecasting and natural disasters. Suggestions are made for specific means by which the countries of the region should increasingly participate in the World Climate Program, both in the applications aspects for immediate benefit and in the research effort for potential future higher benefits. Author (ESA)

N85-16355# National Meteorological Center, Washington, D.C.
CLIMATE APPLICATIONS: GENERAL
James L. Rasmussen *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 82-102 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

User needs for climate applications and assistance and the transformation of data into useful information are discussed. A table giving the climate variables needed for regional and global scales, a preliminary consolidation of requirements, is presented. The World Climate Application Program major objectives are listed. Author (ESA)

N85-16356# National Meteorological Center, Washington, D.C. Climate Analysis Center.
METEOROLOGICAL ASPECTS OF THE 1982-83 EL NINO/ SOUTHERN OSCILLATION EPISODE
James L. Rasmussen *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 103-127 refs (For primary document see N85-16352 07-47)
Avail: NTIS HC A01; print copy available at WMO, Geneva SWFR65

The fluctuations of sea level atmospheric pressure between the South-East Pacific region and the low pressure Indian Ocean region are discussed and related to the El Nino oscillation. The outcome of the 82/83 event is the recognition that oceanographic observations may be of vital social and economic importance at the very time they are being acquired. Actual prediction of coupled ocean-atmosphere phenomena on the time scale of a few months is anticipated. Author (ESA)

N85-16357# Servicio Meteorologico Nacional, Buenos Aires (Argentina).
CLIMATE AND CLIMATE DATA. REPORT ON THE WORKSHOP HELD IN BRASILIA (ARGENTINA) FROM 11-15 APRIL 1983
J. A. J. Hoffman *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 128-140 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Problems of data management concerning the South American region are summarized. The situation in the region as regards existing data management systems, observational networks and the organization of a climate data base is reviewed. The importance of coordination at the national level was stressed. Author (ESA)

N85-16358# Columbian Inst. of Hydrology, Meteorology and Land Improvement, Bogota.
USE OF MINICOMPUTERS FOR THE FORMATION OF HYDROLOGICAL DATA BANKS
Juan Manuel Ramirez *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 141-157 In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The development of a hydrometeorological information system based on minicomputer utilization by a hydrology, meteorology and land improvement agency is described. Basic processing of field data such as climatological log books and river stage observations and records is assured. The storage and retrieval of the most important information and the implementation of special applications is described. Author (ESA)

N85-16359# Buenos Aires Univ. (Argentina).
THE CLIMATE IN FOOD PRODUCTION IN LATIN AMERICA
Juan J. Burgos *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 158-184 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Food requirements in Latin America, the physical and biological factors involved in food production and the economic and social factors in food production are discussed. The role of climate in the actual and potential productivity is emphasized and appropriate references are made regarding the proper use of climatic information for the sake of optimizing production. Quantitative indicators of food needs, crop yields and potential productivity are given for Latin American countries. Author (ESA)

N85-16360# World Meteorological Organization, Geneva (Switzerland).
CROP YIELD FORECASTING
J. Francisco Boshell *In its* Climate Conf. for Latin America and the Caribbean 1984 p 185-199 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The importance and application of climate data in assessing agricultural production are explained. Practical examples are discussed and references are made to corn, rice and wheat, under rainfed and irrigated conditions. The agroclimate models are shown to be of great help to evaluate the production potential and to determine the period of the year when higher yields could be expected. Author (ESA)

N85-16361# Food and Agriculture Organization of the United Nations, Rome (Italy). Plant Production and Protection Div.

THE CHALLENGE OF FOOD PRODUCTION: THE IMPORTANCE OF CLIMATE
Michel Frere *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 200-213 In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Applications of agrometeorology to food production are reviewed. The present food situation is discussed, mentioning the effects of recent climatic extremes in various parts of the world. The importance of monitoring of crops is emphasized and the basic principles of the FAO method are described. The application of climate information to the planning of land use is discussed. The FAO methods to assess at a continental level the land use potential are mentioned. Author (ESA)

N85-16362# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
THE MANAGEMENT OF ATMOSPHERIC RESOURCES IN FOOD PRODUCTION
Fausto Carlos deAlmeida *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 214-219 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The concept of atmospheric resources management is presented as a system capable of collecting, controlling, and disseminating in time to be used by the farm manager. The importance of economic return from the use of meteorological data in a food production system is emphasized. The applications are illustrated by a frost damage example in which the frost probability level is used by the farm manager to reach a decision of whether to turn on the frost protection system or not. Such a system based on digitally processed infrared satellite images is being tested in Brazil. Author (ESA)

N85-16363# World Meteorological Organization, Geneva (Switzerland).
THE EFFECTS OF LONG-PERIODIC FORCING IN A ZERO-DIMENSIONAL CLIMATE MODEL
A. C. Wiin-Nielsen *In its* Climate Conf. for Latin America and the Caribbean 1984 p 220-231 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The direct effect of a periodic forcing on the change of the global mean temperature in a simple zero-dimensional climate model is investigated. A 100,000 yr. period is used. The important aspect of such a model is the way in which the albedo is specified as a function of temperature. It is shown by numerical integrations that a total variation of 10 K may be obtained if the albedo is specified as a parabolic function of temperature in such a way that the steady states occur at T, and T + or - an increment, if that increment is 25 to 30 K. It is also pointed out that such a result depends strongly on the parameterization of the albedo in terms of the global mean temperature. Author (ESA)

N85-16364# World Meteorological Organization, Geneva (Switzerland).
INDEX CYCLES SIMULATED BY A LOW ORDER FORCED BAROTROPIC MODEL
A. C. Wiin-Nielsen *In its* Climate Conf. for Latin America and the Caribbean 1984 p 232-244 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Time integration of a low order barotropic model with forcing and dissipation are used to study variations between low and high index circulations. The low order model has multiple equilibria which may be calculated in advance. The stability of the equilibria is determined by linear perturbation analysis. It is shown that the approach to a stable equilibrium typically takes several months. The equilibrium is reached through a series of damped oscillations whose typical periods are of the order of 1 to 2 months. These developments compare favorably with observational studies of index variations at 500 mb leading to the establishment of quasi-stationary blocking patterns. Author (ESA)

N85-16365# Florida State Univ., Tallahassee.
OCEAN AND CLIMATE, AN EXAMPLE. THE INTERANNUAL VARIABILITY OF THE TROPICAL PACIFIC OCEAN
James J. OBrien *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 245-247 (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The physical mechanisms which cause El Nino are explained. The progress made in the last few years in understanding the oceanic aspects of El Nino are reviewed. It should be possible to predict El Nino if the winds over the western Pacific along the equator are measured. Using infrared sea surface temperature measurements, the development of the warm anomaly along the cost could be measured from space. A forecast of the occurrence of El Nino a few months in advance would be possible. Author (ESA)

N85-16366# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
THE OCEAN AND THE DYNAMICS OF THE TROPICAL ATMOSPHERE; ITS POSSIBLE PREDICABILITY
Antonio D. Moura *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 248-255 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The predictability of the tropical atmosphere is compared to the predictability at middle latitudes. Large features and monthly and seasonal time average may be predictable. The slowly varying boundary conditions of sea surface temperature (and anomalies) influence on climate variability in regions of South America is shown in two cases: flooding in southern South America and severe drought occurrences over North-East Brazil associated with anomalous sea surface temperatures. The need for long term time series and data from different types of satellites is emphasized. Author (ESA)

N85-16367# World Meteorological Organization, Geneva (Switzerland). Working Group on Hydrology of Regional Association 3.
CLIMATOLOGICAL INFORMATION AND WATER RESOURCES
Tabare Palas *In its* Climate Conf. for Latin America and the Caribbean 1984 p 256-276 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The utilization of climatological data, the needs for climate predictions and ways of ensuring communications to the users are detailed. The requirements for climatological products are examined. International cooperation and the development of a data bank are recommended. Author (ESA)

N85-16368# Atmospheric Environment Service, Ottawa (Ontario).
CLIMATE AND WATER QUALITY
James P. Bruce *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 278-299 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The effect on water quality of climate, weather and contaminants transported by the atmosphere are summarized. The influence of air temperature, insolation, precipitation intensity, wind, and drought; disease transmission; and the atmospheric transport and deposition of pollutants are discussed. Author (ESA)

N85-16369# World Meteorological Organization, Geneva (Switzerland). Div. for the Americas.
WATER AND CLIMATE, STUDY OF ONE CASE

E. Basso and R. Broqua *In its* Climate Conf. for Latin America and the Caribbean 1984 p 300-326 refs In SPANISH; ENGLISH summary Original contains color illustrations (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

A hydrology and climatology project in the Brazilian Amazon river basin is described. A square grid data interpolation system produced a meteorological, hydrological, physiographic and topographic data bank, useful for many studies, including the climatic atlas of the area, the agrometeorological zoning to assess crop requirements, and the mathematical model for the lower and middle Amazon. Author (ESA)

N85-16370# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
THE WATER BALANCE AND CLIMATE
Luiz Carlos Baldicero Molion *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 327-338 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The role of hydrological cycles in climate control is discussed. The world water balance and the relationship between the hydrologic cycle and the mean tropospheric flow are discussed. The water budget of the Amazon river basin is examined. It is shown that local evaporation contributes 50% to precipitation in the basin, as opposed to the mid-latitudes where such a contribution is 10%. It appears that a large scale deforestation in the Amazon region would interfere in the regional climate and possibly in the global climate. Author (ESA)

N85-16371# National Inst. of Meteorology, Brasilia (Brazil).
THE POTENTIAL CONTRIBUTIONS OF THE WORLD CLIMATE PROGRAM (WCP) TO THE ECONOMIES OF DEVELOPING COUNTRIES c83
Fernando Pimenta Alves *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 339-356 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The nature and objectives of the World Climate Program are reviewed, including the Climate Data Program, the Climate Applications Program, the Climate Research Program and the Climate Impact Studies Program. Examples of serious socio-economic problems related to climatic factors are presented. The utilization of climatic resources by the underdeveloped countries is discussed showing the importance of developing national climatic programs. Author (ESA)

N85-16372# World Meteorological Organization, Geneva (Switzerland).
SOCIO-ECONOMIC IMPACT OF CLIMATE c80
Francisco J. Andrade (Sub-Secretariat for Agriculture and Hydraulic Resources, Mexico) *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 357-363 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The hypothesis that agroclimatological information is the key requirement for an adequate farming system is put forward. The example of Mexico is analyzed, showing that the importance of droughts and climatological phenomena in general is reduced by an improved socioeconomic structure and the construction of extensive irrigation systems. The irrigated areas covering 5 million hectares are extremely dependent on the rainfall regime. In order to extend farming capacity by using areas which are different from those farmed traditionally, including semidesert areas, Mexico needs to study in depth historical information for forecasting purposes. Author (ESA)

N85-16373# National Center for Atmospheric Research, Boulder, Colo. Environmental and Societal Impacts Group.
CLIMATE AND FISHERIES: A PERUVIAN CASE STUDY c48
Michael H. Glantz *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 365-378 refs Sponsored by NSF (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The climate related anomaly El Nino is chosen to show the effect of decisions by policy makers on the socioeconomic consequences of such anomalies. The parallels in the management of shoaling pelagic fisheries such as the Peruvian anchovy fishery, the Californian sardine fishery, and the South-West African pilchard fishery, strongly suggest that they are worthy of additional comparative research. Author (ESA)

N85-16374# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
ECOLOGICAL IMPACTS OF HYDROELECTRIC PROJECTS IN AMAZONIA c45
Jesus Marden dosSantos *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 379-393 (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Studies on ecosystem modifications in a micro and meso climatic scale for the Tucurui (Brazil) hydroelectric project are presented. The study examined a rational development based on the region's economic potential, without violating the ecological restrictions. Limnology, Macrophytes, Ichtyofanna, phytomas, meteorology and climatology are discussed. The perturbations are not necessarily prejudicial to the ecosystem that is characterized by dynamic processes resulting from natural perturbations. Author (ESA)

N85-16375# Consejo Nacional de Investigaciones Cientificas y Technicas, Buenos Aires (Argentina).
ENERGY AND CLIMATE: PROBLEMS IN LATIN AMERICA c44
V. Barros *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 394-407 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The effect of climate on the demand, supply and use of energy in Latin America during the rest of the century is discussed. It is thought that the demand for climatological information on the part of the energy sector will increase and will require the development of suitable techniques for processing the inadequate basic information. The effects related to carbon dioxide release are described. The region's collaboration in international efforts to study this topic is favored. Author (ESA)

N85-16376*# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
THE AMAZON AND CLIMATE
Carlos A. Nobre *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 408-416 refs (For primary document see N85-16352 07-47)
(Contract NAS5-27297)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65 CSCL 04B

The climatologies of cloudiness and precipitation for the Amazon are reviewed. The physical causes of observed features are explained. The question whether deforestation leads to a reduction in evapotranspiration into the atmosphere is examined, as well as the reduction in precipitation and its implication for the global climate. There are indications that for large scale clearing of tropical rain forests there would indeed be a reduction in rainfall, which would have global effects in terms of climate and weather. Author (ESA)

N85-16377# World Meteorological Organization, Geneva (Switzerland).
A MICROPROCESSOR DATA SYSTEM FOR DEVELOPING

COUNTRIES c62

Amos Eddy (Oklahoma Climatological Survey) *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 417-427 (For primary document see N85-16352 07-47)

Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The problem of assisting developing countries to implement the use of computer technology in their climatology programs in a cost effective manner is discussed. Data entry and archiving as well as simple data processing and graphical representation using microprocessors are examined. A system developed for the World Climate Program is described. The software is designed to accept local models and use local data to help solve local problems. A training program to utilize the system is also described.

Author (ESA)

N85-16378# Costa Rica Univ., San Jose. School of Physics.

REQUIREMENTS FOR TRAINING IN CLIMATE-RELATED SUBJECTS c80

Jorge A. Amador *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 428-434 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)

Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Problems encountered in climate related training in Central America are discussed. Ideas for solving the problem of interdisciplinary training are proposed. The problem of interinstitutional collaboration needed to achieve progress in regional meteorology is also discussed. Author (ESA)

N85-16379# Comision Nacional de Investigaciones Espaciales, Buenos Aires (Argentina).

EDUCATION AND TRAINING FOR THE CLIMATE RELATED ACTIVITIES IN LATIN AMERICA AND THE CARIBBEAN c80

Osvaldo F. Canziani *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 435-446 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)

Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Human activities associated with the problem of climate are discussed with emphasis placed on the study of future atmospheric resources deterioration due to human activities. The training situation in the area and its shortcomings are analyzed in the light of training requirements stemming from the World Climate Program. Author (ESA)

N85-16380# Academy of Sciences, Alamar (Cuba). Dept. of Agricultural Meteorology.

EVALUATION OF THE CLIMATIC RESOURCES OF CUBA APPLIED TO AGRICULTURAL WORK

Emma Palenzuela, Cesar J. Menendez, and Paula Fuentes *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 447-462 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)

Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Cuba's light, heat and moisture resources and wind regime were studied. Data from meteorological stations and from a rainfall network were used. Two main seasons were distinguished. The beginning of both seasons is found to be related to the passage of the mean daily air temperature above and below 25 C, respectively. It is found that the duration and intensity of the summer minimum rainfall period is critical in the most easterly provinces of the country. Good results are obtained for the application of the Berliand method for calculating global radiation from total cloud cover. Maps for the regional agroclimatic zones of Cuba are drawn. Author (ESA)

N85-16381# Ministry of Works, Georgetown (Guyana).

THE USE OF HYDROMETEOROLOGICAL DATA IN EXPLAINING SHRIMP CYCLES IN GUYANA c48

Chander Persaud *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 462-471 refs (For primary document see N85-16352 07-47)

Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

Guyanan shrimp catch data from 1961 to 1982 are examined. A long term cycle of 22 yr, in phase with annual bright sunshine data, and a weak short period cycle of 3 to 4 yr, approximately in phase with the discharge of Guyana's largest river are found. A strong seasonal relationship between monthly sunshine and shrimp catch is also shown. Factors related to climate and hydrology may be the decisive factors in determining the abundance of Guyana's marine resources. Author (ESA)

N85-16382# World Meteorological Organization, Geneva (Switzerland). Dept. Ciencias.

THE EL NINO PHENOMENON AND ITS AGROMETEOROLOGICAL IMPLICATIONS

Jorge Valdivia Ponce (Ricardo Palma University, Lima) and Itamar Noe Dobrea *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 472-509 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)

Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

The oceanographic and meteorological anomaly along the Peruvian coast known as El Nino is studied. The economic loss in the 1982-83 episode is estimated at $500 million. The consequences of this phenomenon in terms of the development of vegetation, anomalous migration of fish, as well as damage to crops, roads and railways show the urgent need to gain thorough knowledge of the origin and potential development of the phenomenon. Author (ESA)

N85-16383# Naval Research Lab., Washington, D. C.

CONDITIONS GOVERNING THE FORMATION OF STRATOCUMULUS CLOUDS OVER THE WESTERN ATLANTIC DURING COLD AIR OUTBREAKS

R. F. Hoffman, R. K. Jeck, and R. L. Clark 28 Sep. 1984 48 p (RR0-3303)

(AD-A146780; NRL-MR-5428) Avail: NTIS HC A03/MF A01 CSCL 04/2

Extensive stratocumulus (Sc) clouds from frequently in the winter months over the western North Atlantic Ocean during episodes of cold air advection off the continent. During a four month study period (November 1981 through February 1982), 25 separate episodes resulted in varying extents and amounts of maritime cloud cover during 36 days, or 30% of the time during the study period. An examination of satellite imagery and surface analysis charts shows that these offshore Sc formations occur primarily following the passage of a cold front offshore, or in the southwest quadrant of a passing cyclone, or with the development of a high pressure ridge over the Atlantic coastal states. Data from four buoys between Cape Hatteras and Maine were used to look for thresholds in air-sea temperature difference (delta tan) and surface windspeed for the initiation and maintenance of these Sc formations. For locations from 25 to 200 miles (40 to 300km) east of Cape Hatteras, thresholds of 5 C and 5 m/s at a given at-sea location seem to be a good predictor for the existence of Sc overhead. The reliability of this rule decreases rapidly within 50 miles (80km) of the shoreline where the fetch may be inadequate. For locations 150 miles (240km) or so east of Cape Cod and in the Gulf of Maine, these rules break down and the air sea temperature difference and windspeed do not appear to have any useful predictor capability. GRA

N85-16384# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). ALCONBURY RAF UNITED KINGDOM, PARTS A-F Final Report

Apr. 1984 395 p Supersedes USAFETAC/DS-79/100; N80-73777

(AD-A146913; AD-E850743; USAFETAC/DS-84/014; USAFETAC/DS-79/100) Avail: NTIS HC A17/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Alconbury RAF, United Kingdom. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky Cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16385# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). MCCHORD AFB, WASHINGTON, PARTS A-F Final Report

Apr. 1984 434 p Supersedes Rept no. USAFETAC/DS-80/052; N80-33060

(AD-A146914; AD-E850739; USAFETAC/DS-84/015) Avail: NTIS HC A19/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for McChord AFB, Washington. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky Cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16386# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). MILDENHALL RAF, UNITED KINGDOM, PARTS A-F Final Report

Apr. 1984 400 p Supersedes USAFETAC/DS-79/095; N80-73767

(AD-A146915; AD-E850742; USAFETAC/DS-84/016; USAFETAC/DS-79/095) Avail: NTIS HC A17/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Mildenhall RAF, United Kingdom. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky Cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16387# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). DOBBINS AFB, GEORGIA, PARTS A-F Final Report

25 Apr. 1984 458 p Supersedes USAFETAC/DS-80/091; N81-21705

(AD-A146916; AD-E850741; USAFETAC/DS-84/017; USAFETAC/DS-80/091) Avail: NTIS HC A20/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Dobbins AFB, Georgia. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky Cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16388# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). SHEMYA AFB, ALASKA, PARTS A-F Final Report

May 1984 414 p Supersedes USAFETAC/DS-78/012; N79-75958

(AD-A146917; AD-E850740; USAFETAC/DS-84/018; USAFETAC/DS-78/012) Avail: NTIS HC A18/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Shemya AFB, Alaksa. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky Cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16389# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). POPE AFB, FAYETTEVILLE, NORTH CAROLINA, PARTS A-F Final Report

Jun. 1984 476 p Supersedes USAFETAC/DS-81/051; USAFETAC/DS-81/051; N81-32793

(AD-A146918; AD-E850752; USAFETAC/DS-84/020; USAFETAC/DS-81/051) Avail: NTIS HC A21/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Pope AFB, Fayetteville, North Carolina. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16390# Air Force Environmental Technical Applications Center, Scott AFB, Ill.
REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). SONDESTROM AB, GREENLAND, PARTS A-F Final Report
Jul. 1984 463 p Supersedes USAFETAC/DS-80/029
(AD-A146919; AD-E850745; USAFETAC/DS-84/021; USAFETAC/DS-80/029) Avail: NTIS HC A20/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Sondrestrom AB. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky Cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16391# Air Force Environmental Technical Applications Center, Scott AFB, Ill.
REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). ENGLAND AFB, ALEXANDRIA, LOUSIANA, PARTS A-F Final Report
Jul. 1984 458 p Supersedes USAFETAC/DS-81/063; N81-32798
(AD-A146920; AD-E850749; USAFETAC/DS-84/023; USAFETAC/DS-81/063) Avail: NTIS HC A20/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for England AFB, Alexandria, Louisiana. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; Sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16392# Air Force Environmental Technical Applications Center, Scott AFB, Ill.
REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). SPANGDAHLEM AB, GERMANY, PARTS A-F Final Report
Aug. 1984 398 p Supersedes USAFETAC/DS-79/102
(AD-A147166; AD-E850750; USAFETAC/DS-84/027; USAFETAC/DS-79/102) Avail: NTIS HC A17/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Spangdahlem AB, Germany It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea level pressure). Data are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurrence tables. GRA

N85-16393# Air Force Environmental Technical Applications Center, Scott AFB, Ill.
LIMITED SURFACE OBSERVATIONS CLIMATIC SUMMARY (LISOCS). HOHENFELS, AAF, WEST GERMANY Final Report
Aug. 1984 145 p
(AD-A147167; AD-E850753; USAFETAC/DS-84/025) Avail: NTIS HC A07/MF A01 CSCL 04/2

This report is similar to a Revised Uniform Summary of Surface Weather Observations (RUSSWO) except the summary generated is from data observed at limited-duty observation sites. This summary is blocked based on the normal hours of observation and only those tables using hourly data are presented. Caution must be exercised when using these summaries as the data reflect conditions occurring only during limited duty hours of operation. This report is a five-part statistical summary of surface weather observations for Hohenfels AAF, Germany. It contains the following parts: (1) Weather conditions; (2) Surface winds; (3) Ceiling versus visibility; (4) Psychrometric summaries (psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (5) Pressure summary (means, standard deviations and observation counts of station and/or sea-level pressure). Summaries in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurrence tables. GRA

N85-16394# Air Force Environmental Technical Applications Center, Scott AFB, Ill.
REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). OFFUTT AFB, NEBRASKA, PARTS A-F Final Report
Aug. 1984 490 p Supersedes USAFETAC/DS-79/060; N80-71464
(AD-A147183; AD-E850744; USAFETAC/DS-84/014; USAFETAC/DS-79/060) Avail: NTIS HC A21/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Offutt Air Force Base, Nebraska. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16395# Air Force Environmental Technical Applications Center, Scott AFB, Ill.
REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). HILL AFB, UTAH, PARTS A-F Final Report
Sep. 1984 505 p Supersedes USAFETAC/DS-80/052; N80-33060
(AD-A147184; AD-E850746; USAFETAC/DS-84/029; USAFETAC/DS-80/052) Avail: NTIS HC A22/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Hill Air Force Base, Utah. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum tempera-

tures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16396# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). PARTS A-F: HOMESTEAD AFB, FLORIDA Final Report

Sep. 1984 421 p Supersedes USAFETAC/DS-79/038 AD-A074 664

(AD-A147203; AD-E850747; USAFETAC/DS-84/032; USAFETAC/DS-79/038-Rev) Avail: NTIS HC A18/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for Homestead AFB, Florida. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16397# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

LIMITED SURFACE OBSERVATIONS CLIMATIC SUMMARY (LISOCS). CAMP CASEY, TONG DU CHON, KOREA Final Report

Sep. 1984 217 p

(AD-A147204; AD-E850755; USAFETAC/DS-84/031) Avail: NTIS HC A10/MF A01 CSCL 04/2

This report is similar to a Revised Uniform Summary of Surface Weather Observations (RUSSWO) except the summary generated is from data observed at limited-duty observation sites. This summary is blocked based on the normal hours of observation and only those tables using hourly data are presented. Caution must be exercised when using these summaries as the data reflect conditions occurring only during limited duty hours of operation. This report is a five-part statistical summary of surface weather observations for Camp Casey, Tong Du Chon, Korea. It contains the following parts: (1) Weather conditions; (2) Surface winds; (3) Ceiling versus visibility; (4) Psychrometric summaries (psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (5) Pressure summary (means, standard deviations and observation counts of station and/or sea-level pressure). Summaries in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurrence tables. GRA

N85-16398# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

LIMITED SURFACE OBSERVATINS CLIMATIC SUMMARY (LISOCS). ANSBACK AHP, GERMANY Final Report

Sep. 1984 299 p

(AD-A147205; AD-E850754; USAFETAC/DS-84/030) Avail: NTIS HC A13/MF A01 CSCL 04/2

This report is similar to a Revised Uniform Summary of Surface Weather Observations (RUSSWO) except the summary generated is from data observed at limited-duty observation sites. This summary is blocked based on the normal hours of observation and only those tables using hourly data are presented. Caution must be exercised when using these summaries as the data reflect conditions occurring only during limited duty hours of operation. This report is a five-part statistical summary of surface weather observations for Ansbach AHP, Katterbach, Germany. It contains the following parts: (1) Weather conditions; (2) Surface winds; (3) Ceiling versus visibility; (4) Psychrometric summaries (psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (5) Pressure summary (means, standard deviations and observation counts of station and/or sea-level pressure). Summaries in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurrence tables. GRA

N85-16399# Air Force Environmental Technical Applications Center, Scott AFB, Ill.

REVISED UNIFORM SUMMARY OF SURFACE WEATHER OBSERVATIONS (RUSSWO). O'HARE INTERNATIONAL AIRPORT, CHICAGO, PARTS A-F Final Report

7 Oct. 1984 387 p

(AD-A147206; AD-E850751; USAFETAC/DS-84/033) Avail: NTIS HC A17/MF A01 CSCL 04/2

This report is a six part statistical summary of surface weather observations for O'Hare International Airport. It contains the following parts: (1) Weather conditions; Atmospheric phenomena; (2) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (3) Surface winds; (4) Ceiling versus visibility; sky cover; (5) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperatures and relative humidity); and (6) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables. GRA

N85-16400# Army Engineer Topographic Labs., Fort Belvoir, Va.

DIURNAL FREEZE-THAW FREQUENCIES IN SELECTED REGIONS OF THE HIGH LATITUDES Final Report, Dec. 1982 - Aug. 1983

R. L. Wexler Jul. 1984 26 p

(DA Proj. 4A1-61102-AT-24)

(AD-A147276; ETL-0364) Avail: NTIS HC A03/MF A01 CSCL 04/2

The purpose of this study is to provide information on the incidence of daily freezing conditions, i.e., frost days (min < or = O C), and freeze-thaw days (min < or = 0 C max > O C), per month or year throughout Alaska, Eastern Siberia, Iceland, and Greenland. Tables are provided of the above parameters. In addition, linear regression equations were developed for each area for deriving the above information from ordinary climatic data. Station models of percent days per month with freeze-thaw throughout the year are also given for a range of climates in the regions indicated as well as for several German stations representing a range of elevation. Another set of models shows that the percent freeze-thaw per month could be expressed as a function of mean monthly temperature. The constants for the latter (sine) function reflect the continentality of the station. The various models presented demonstrate the relationship between daily freezing conditions and the temperature regime. The results should improve understanding of periglacial activity and provide a means of predicting possible climatic effects on the construction of buildings roads, and airport runways. GRA

N85-16401# Army Missile Command, Redstone Arsenal, Ala. Research Directorate.

INTERRELATIONSHIP OF ATMOSPHERIC PARAMETERS IN HONDURAS

D. A. Stewart, O. M. Essenwanger, and L. J. Levitt Jun. 1984 40 p
(AD-A147371; AD-E950598; AMSMI/RR-TR-84-6) Avail: NTIS HC A03/MF A01 CSCL 04/2

This report summarizes a through literature survey of Honduran climate and a small amount of supplementary material from neighboring countries. The results are compared with an analysis of three-hourly meteorological data from Tela and Tegucigalpa for the period 1973-1981. Honduras is a small Central American country which has a varied climate because of the extremely uneven terrain. Diurnal variations of temperature are larger than seasonal variations, and the mean depends primarily upon elevation. Seasonal variations of absolute humidity are greater than diurnal variations, and the means are larger in the coastal areas. Diurnal variations of wind speed are larger than seasonal variations, and speeds are larger in mountainous areas. Visibilities are typically lower in spring throughout Honduras than during the other seasons. Precipitation is the element which is most variable in space and time, and even the mean has a very complex spatial pattern. This report also includes information about cloud amounts and solar radiation. Author (GRA)

N85-16402# Air Force Geophysics Lab., Hanscom AFB, Mass.
SNOW CHARACTERIZATION MEASUREMENTS FROM SNOW-TWO/SMOKE WEEK 6
B. A. Main and R. O. Berthel 26 Oct. 1984 10 p
(AD-A147423; AFGL-TR-84-0277) Avail: NTIS HC A02/MF A01 CSCL 04/2

Snow characterization measurements acquired during SNOW-TWO/Smoke Week VI are presented. A summary of data for 8 days in January 1984 is given. These data consist of fall velocity, snow structure, and snowrate as recorded by Laboratory prototype equipment. A new concept of back lighting on the fall velocity indicator is discussed and data examples shown. Snowrate plots, fall velocity and crystal type information are presented for selected periods. GRA

N85-16403# Air Force Geophysics Lab., Hanscom AFB, Mass.
AN EVALUATION OF AN ADVECTION FOG PREDICTION MODEL Final Scientific Report, Oct. 1981 - Sep. 1983
J. Weyman 6 Jun. 1984 47 p
(AF Proj. 6670)
(AD-A147436; AFGL-TR-84-0162; AFGL-ERP-883) Avail: NTIS HC A03/MF A01 CSCL 04/2

In response to Air Weather Service requirements, the Air Force Geophysics Lab has been involved in research in the development of mesoscale advection fog prediction techniques. A two-dimensional fog prediction model developed at the Naval Environmental Prediction Research Facility (NEPRF) was selected for evaluation because it can operate on a mini-computer of the size planned for the Air Force's Automated Weather Distribution System (AWDS). Six case studies developed by Calspan Advanced Technology Center were used to test the model's accuracy. These case studies covered a wide range of fog/stratus formation and dissipation stages. Four major weaknesses were identified in the model. The most important was that cloud tops increased in temperature through infrared radiative heat processes rather than decreased. The other weaknesses include lack of solar radiation processes, unreliable treatment of the height of mixed layer during stable conditions, and insufficient handling of vertical motions. The model may have potential in AWDS. However, these weaknesses must first be corrected. GRA

N85-16404# Naval Postgraduate School, Monterey, Calif.
EXPERIMENTS IN FORECASTING ATMOSPHERIC MARINE HORIZONTAL VISIBILITY USING MODEL OUTPUT STATISTICS WITH CONDITIONAL PROBABILITIES OF DISCRETIZED PARAMETERS M.S. Thesis
M. L. Karl Jun. 1984 166 p
(AD-A147574) Avail: NTIS HC A08/MF A01 CSCL 04/2

This thesis describes the development and application of a program to forecast important air/ocean parameters using the method(s) of model output statistics. The focus of this operationally oriented study is to forecast atmospheric marine horizontal visibility using a discrete analysis of observed visibility and the Navy's Operational Global Atmospheric Prediction System (NOGAPS) model output parameters. Three strategies (two based on maximum-probability and one based on natural-regression) are compared to two multiple laser regression methods. The primary data set is from a North Atlantic Ocean are bounded approximately by the North American coast from Norfolk, Va. to St. Johns, Newfoundland, and then eastward to about 37.5 deg W. Both the dependent and independent data were derived from the same basic set. New or unfamiliar concepts, in addition to the primary method, include the statistical division of the North Atlantic Ocean into physically homogeneous areas, two new threshold models for the application of linear regression equations, linear regression based upon a decision-tree concept, functional dependence of predictors and class errors. Results show that the method proposed by Preisendorfer out performs multiple linear regression. GRA

N85-16405# Aerospace Corp., El Segundo, Calif. Space Sciences Lab.
REMOTE SENSING OF THE HIGH LATITUDE IONOSPHERE
P. F. Mizera and D. J. Gorney 1 Aug. 1984 35 p
(Contract F04701-83-C-0084)
(AD-A147881; TR-0084(4478-32)-1; SD-TR-84-30) Avail: NTIS HC A03/MF A01 CSCL 04/2

Remote sensing of the Earth's ionosphere has many applications to radio wave communications. Techniques to monitor perturbations of the quiescent ionosphere at high latitudes from satellites are described, which include observations in the visible, ultra-violet and X-ray wavelengths. Originator-supplied keywords include: auroral, and density perturbations. GRA

N85-16406# Oak Ridge National Lab., Tenn.
SIMULATING RESPONSES TO EXPECTED CLIMATE CHANGE IN EASTERN NORTH AMERICA: APPLICATIONS TO DECISION-MAKING IN THE FOREST INDUSTRY
Allen M. Solomon and Darrell C. West 1984 35 p refs Presented at the EPA/SAF/NFPA Conserv. Found. Workshop on Effects of CO-2 Increases on the Forest Ind., Boulder, Colo., 25 Jun. 1984
(Contract DE-AC05-84OR-21400; Grant NSF BSR-81-15316)
(DE85-001272; CONF-8406209-1) Avail: NTIS HC A03/MF A01

The effects of rising CO_2 on climate are debatable even if the climate change projections from general circulation models of the atmosphere are proven correct. Responses by forests on specific small tracts of land are not intuitively obvious. Standard regression techniques may be misleading or invalid for predictions of future structural or compositional responses; the ecological systems are simply too complex, and combinations of future climatic variables are too different from those of today. The problem may be soluble with a modeling approach that can be based upon documented differences in response by individual tree species to separate and combined environmental variables. Such an approach was developed. It is shown how the individual natural histories of tree species (warmth and moisture requirements, shade and root-competition tolerance, regeneration and mortality characteristics) can be interfaced with intra-annual variations and shifting long-term means in climate variables. The resulting model projects long-term forest ecosystem behavior under expected future conditions that may be quite different from those found on the modern landscape. Use of the model by applying it to land transaction decisions in which long-term considerations are required is illustrated. DOE

N85-16407# Royal Netherlands Meteorological Inst., De Bilt. Klimatologische Dienst.
SYNOPTICAL OBSERVATIONS OF SNOW DEPTHS AT DUTCH METEOROLOGICAL STATIONS, 1956 - 1977
Jan vanderHorst 1984 154 p In DUTCH; ENGLISH summary
(KNMI-TR-51; B8473799) Avail: NTIS HC A08/MF A01

A set of snow depths observations is given for the period 1956 - 1977. The observations were made at 09.00 hr UT. More than 130 tables indicate for the winter half year (November-April)

the snow depths for 18 stations. If necessary May and October are included. Author (ESA)

N85-16408# Royal Netherlands Meteorological Inst., De Bilt. Fysisch Meteorologisch Onderzoek.
WIND SHELTERING CORRECTION [BESCHUTTINGSCORRECTIE WIND]
B. Oemraw 1984 70 p refs Partly in DUTCH and ENGLISH
(KNMI-TR-52; B8469217) Avail: NTIS HC A04/MF A01

An objective exposure correction method for average wind speeds measured at a sheltered location was developed. Steps necessary to determine the sheltering corrections for a given station are described. If satisfactory agreement is found between calculated station roughness and the terrain characteristics of some sectors, the calculated sheltering factors can be used for all sectors for the calculation of the potential wind speed as well as for the transformation of the measured wind to an arbitrary height above an arbitrary terrain. Author (ESA)

N85-16409# Royal Netherlands Meteorological Inst., De Bilt. Instrumentele Afdel.
COMPARATIVE INVESTIGATION OF THREE COMMERCIAL RADIOSONDE SYSTEMS
K. Annema, D. Boersma, W. A. A. Monna, and S. H. Muller 1984 22 p refs Partly in DUTCH and ENGLISH
(KNMI-TR-53; B8471111) Avail: NTIS HC A02/MF A01

Radiosonde systems were compared as to wind detection, resolution of fine structures and operating convenience. The accuracy of all three systems is acceptable for synoptic pressure, temperature, and relative humidity soundings, but does not fully meet the proposed requirements. A reliable statistical comparison was not always possible due to the limited number of successful flights. The wind measurements from RS80 sonde and radar are found to be extremely similar. The Beukers sonde produces unusable results. Small temperature sensors offer advantages with respect to radiation error and time constant. Cloud passages followed by a humidity jump can cause wet (ice) bulb effects on the temperature profile. Bimetal sensors in ducts are hardly sensitive to this error due to their geometry. Concerning operating convenience, the RS21 is a simple system demanding much manpower and has a high chance of operator-induced errors; the RS80 is convenient to operate; the Beuk is convenient to operate except for several details and has an attractive display of sounding on screen. Author (ESA)

N85-16410# National Weather Service, Salt Lake City, Utah.
THE 500 MILLIBAR SIGN FREQUENCY TELECONNECTION CHARTS: WINTER
Dec. 1983 165 p refs
(PB85-106276/GAR; NOAA-TM-NWS-WR-182) Avail: NTIS HC A08/MF A01 CSCL 04B

The question of spacial relationships (teleconnectivity) between anomalies in the upper all flow patterns is an old one, but one that recently has received a great deal of attention. One way to make use of the correlation patterns in operational forecasting is through the use of sign frequency teleconnection charts. In this report a sign frequency chart gives the probability of above or below normal heights around the Northern Hemisphere given a height anomaly at a particular latitude/longitude. The charts contained in this and 3 other Technical Memoranda are sign frequency charts for 500 mb 5 day means. There are some major differences between these new charts and those produced in 1955, in the quality of data used and the method of case selection. Additionally, the new charts are divided into four seasons. GRA

N85-16229# Joint Publications Research Service, Arlington, Va.
RAZREZY PROGRAM RESEARCH IN THE TROPICAL ATLANTIC
B. O. Nelepo and V. V. Yefimov *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 34-42 refs Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 4, Apr. 1984 p 13-19 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

48 OCEANOGRAPHY

Includes biological, dynamic and physical oceanography; and marine resources.

N85-16411# Marine Research Inst., Helsinki (Finland).
INVESTIGATION OF THE ICE DYNAMICS IN THE MARGINAL ICE ZONE Interim Report, 1 Jun. - 31 Aug. 1984
M. Lepparanta Aug. 1984 13 p
(Contract DAJA45-83-C-0034; DA Proj. 1T1-61102-BH-57)
(AD-A146729; IR-5) Avail: NTIS HC A02/MF A01 CSCL 08/12

The report describes an extension of the use of the Del Norte microwave transponder system to obtain improved accuracy of measurement of ice movements. Among the improvements was the use of two transponders on a single flow, making it possible to obtain rotational as well as translational movements. The ice flow were normal for marginal ice zone summer conditions. Flow sizes ranged from 30m to 200m, but a few large flows of 1-2km were present, ice thickness was 1-4m. Ice concentration ranged from 0.6 to 0.9 until 8 July 84, after which it declined to 0.3. Flows may rotate as much as 90 deg in a 24hr period. GRA

N85-16412# Woods Hole Oceanographic Institution, Mass.
A COMPILATION OF MOORED CURRENT METER AND WIND RECORDER DATA. VOLUME 35: LONG-TERM UPPER OCEAN STUDY (LOTUS) (MOORINGS 764, 765, 766, 767, 770), MAY 1982 - APRIL 1983
S. A. Tarbell, N. J. Pennington, and M. G. Briscoe Aug. 1984 156 p
(Contracts N00014-76-C-0197; N00014-84-C-0134)
(AD-A147103; WHOI-84-36) Avail: NTIS HC A08/MF A01 CSCL 08/3

LOTUS was a two-year experiment near 34 deg N, 70 deg W, designed to acquire and analyse a continuous set of measurements of currents and temperatures in the upper, open ocean together with local hydrography, meteorology, and mesoscale oceanographic features. The first scientific moorings were deployed in May 1982. The first year of mooring data, from May 1982-April 1983, is presented here. GRA

N85-16413# Florida State Univ., Tallahassee. Geophysical Fluid Dynamics Inst.
INTERACTIONS BETWEEN MEAN FLOW AND FINITE-AMPLITUDE MESOSCALE EDDIES IN A BAROTROPIC OCEAN
B. Cushman-Roisin, D. W. McLaughlin, and G. Papanicolaou 1984 23 p Repr. from Geophysical Astrophysical Fluid Dynamics, v. 29, 1984 p 333-353
(Contract N00014-82-C-0404)
(AD-A147249; GFDI-CONTRIB-204; Rept-229) Avail: NTIS HC A02/MF A01 CSCL 08/3

A major objective in oceanography is the modelling of large-scale, wind-driven circulation of an oceaic basin. For such an effort to yield quantitatively accurate results, mesoscale motions and their interactions with the large-scale inhomogeneity have to be retained. Oceanic mesoscale eddies are represented as a horizontally propagating wave field in a non-uniform environment for the analysis resides in the study of finite-amplitude eddies. The interactions of a plane wave with the mean flow are considered. R.S.F.

N85-16414# Woods Hole Oceanographic Institution, Mass.
THE LONG TERM UPPER OCEAN STUDY (LOTUS). CRUISE SUMMARY AND HYDROGRAPHIC DATA REPORT, OCEANUS 154, MAY 1984 Technical Report
E. T. Montgomery, N. J. Pennington, and M. G. Briscoe Oct. 1984 48 p
(Contract N00014-84-C-0134)
(AD-A147908; WHOI-84-39) Avail: NTIS HC A03/MF A01 CSCL 08/10

OCEANUS cruise 154 (16-23 May 1984) was the final cruise in the two year field program of the Long Term Upper Ocean Study (LOTUS). The work occurred primarily in the LOTUS AREA (34 N, 70 W), where the entire moored array was recovered. The

moorings were the following: the LOTUS-6 surface mooring (No. 792), a subsurface mooring (NO. 788), two intermediate moorings (Nos. 789, 790), and a C. S. Draper Labs profiling current meter (PCM1H) mooring. Also on OCEANUS 154, a mooring was deployed for the U.S. Geological Survey at approximately 40 10 N, 69 58 W. On the return trip, an engineering test mooring was recovered at approximately 39 11 N, 70 01 W, some elements removed for testing, and then redeployed in the same location. This report presents the hydrographic data collected on OCEANUS 154, as well as providing details of the work that was accomplished. GRA

N85-16415# National Oceanic and Atmospheric Administration, Washington, D. C. National Environmental Satellite, Data and Information Service.
OCEANOGRAPHIC DATA FOR DEVELOPMENT OF THE US EXCLUSIVE ECONOMIC ZONE
Aug. 1984 84 p refs
(PB85-106458/GAR; NESDIS-Environ-Invent-2) Avail: NTIS HC A05/MF A01 CSCL 08J

Information on oceanographic data available from measurements at approximately 500,000 locations within the U.S. Exclusive Economic Zone (EEZ) is given. Fifteen data types of potential use in economic development were selected for presentation from the more than forty oceanographic data files routinely maintained by the National Oceanographic Data Center. These organizations serve as national repositories and dissemination facilities for global oceanographic, climatological, and geophysical data. Author (GRA)

N85-16227# Joint Publications Research Service, Arlington, Va.
EXPLORING OCEAN'S MINERAL WEALTH
A. S. Monin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 14-17 Transl. into ENGLISH from Nedelya (Moscow), no. 33, 13-19 Aug. 1984 p 7 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16228# Joint Publications Research Service, Arlington, Va.
HYDROLOGIC CHARACTERISTICS OF THE MEDITERRANEAN AND BLACK SEA
M. G. Perov, Yu. S. Kalashnikova, N. Ya. Kuklina, and I. F. Lukashin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 25-33 refs Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 4, Apr. 1984 p 79-84 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16373# National Center for Atmospheric Research, Boulder, Colo. Environmental and Societal Impacts Group.
CLIMATE AND FISHERIES: A PERUVIAN CASE STUDY
Michael H. Glantz *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 365-378 refs Sponsored by NSF (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

N85-16381# Ministry of Works, Georgetown (Guyana).
THE USE OF HYDROMETEOROLOGICAL DATA IN EXPLAINING SHRIMP CYCLES IN GUYANA
Chander Persaud *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 462-471 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

51 LIFE SCIENCES (GENERAL)

Includes genetics.

N85-16416# Joint Publications Research Service, Arlington, Va.
USSR REPORT: LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES Abstracts Only
19 Jul. 1984 124 p Transl. into ENGLISH from various Russian articles
(JPRS-UBB-84-015) Avail: NTIS HC A06

Topics relating to the following subject areas are discussed: aerospace medicine, agriculture, biochemistry, epidemiology, food processing, human factors, and immunology. In addition, laser applications, marine biology, microbiology, medicine, radiation effects, pharmocology, and toxicology are considered. Physiology, public health, psychology, radiobiology, and veterinary medicine are also addressed. For individual titles, see N85-16417 through N85-16420.

N85-16417# Joint Publications Research Service, Arlington, Va.
ESTABLISHMENT OF POSTURE AND WORKING MOVEMENTS OF PILOT IN AIR CRASH ENQUIRIES Abstract Only c54
A. V. Klyuyev and V. N. Artemov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 1 Transl. into ENGLISH from Sudebno-Med. Ekspertiza (Moscow), no. 3, Jul. - Sep. 1984 p 11-12 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

Experts' opinion concerning the whereabouts, condition, and actions of air crew members at the time of a crash provide valuable information during an air accident inquiry. An example of how such information is gained is given. The second pilot's position in the plane's cabin and his actions at the time of a crash are determined by analysis of flight parameters at the moment of crash, location of the cabin after the crash, speed of the plane at impact, and injuries found on the body of the pilot. Experimental modelling of injuries to crew members inside of a plane of the same type as the one involved in the crash also provide important information concerning a crash. Author

N85-16418# Joint Publications Research Service, Arlington, Va.
SPEECH-ACTION INTERRELATIONSHIPS IN OPERATIONAL WORK Abstract Only c54
N. V. Krylova and A. K. Bokovikov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 28 Transl. into ENGLISH from Psikhologicheskiy Z. (Moscow), v. 4, no. 6, Nov. - Dec. 1983 p 48-53 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

The temporal and logical relationship between speech and motor activity were evaluated within the framework of an operator's performance. The quality of the report was evaluated in terms of the complexity of the task to be accomplished. In many situations in which tracking movements of increasing complexity had to be performed, the quality of the oral report improved. This fact was attributed to the concentration of the psychological reserves on the task at hand which apparently favored greater mental efficiency. The simultaneous combination of an oral report and motor activity resulted in the situation where the report either preceded or followed the physical manipulation. Author

N85-16419# Joint Publications Research Service, Arlington, Va.
EFFECTS OF INDIVIDUAL MNEMONIC CHARACTERISTICS ON PROBLEM SOLVING Abstract Only c53
L. D. Gorbunova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 28 Transl. into ENGLISH from Psikhologicheskiy Z. (Moscow), v. 4, no. 6, Nov. - Dec. 1983 p 106-108 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

Psychophysiological analysis of work performance conducted with 81 individuals demonstrates that different operational problems relay on different types of memory. Decoding of multi-dimensional signal systems within a limited time frame relies primarily on efficient short-term memory processes. However, operations resting on continuous diagnosis of a variable situation and decision-making responses demands an overall high-degree of mnemonic efficiency and especially long-term retention. Evaluation of individual performance on short-term and long-term memory tests may prove to be of value in determining occupational suitability. Author

N85-16420# Joint Publications Research Service, Arlington, Va.
MENTAL STATUS IN RELATION TO SPECIAL CONDITIONS OF ACTIVITY Abstract Only c53
N. D. Zavalova and V. A. Ponomarenko *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 29 Transl. into ENGLISH from Psikhologicheskiy Z. (Moscow), v. 4, no. 6, Nov. - Dec. 1983 p 92-105 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

The role of mental status in relation to human performance in the man-machine-environment setting was evaluated with particular emphasis on situations in which there is no in-flight awareness of faulty performance by a pilot. The basic premise is that outside influences, e.g., environmental factors such as hypoxia, affect mentation and lead to erroneous perception such an analysis are inappropriate to the situation at hand but, within the framework of the altered mental state, are not perceived as such despite their dire consequences, particularly in in-flight situations. A solution to such problems would require a systems approach treating of mentation separately from normal somatic function as well as in concert with the latter. Such an approach may provide an objective evaluation to the dissociation between subjective perceptions and the quality of analysis which leads to certain actions that may not be appropriate to the situation as a whole. Author

N85-16421*# National Aeronautics and Space Administration, Washington, D. C.
THE LIPID COMPOSITION AND ITS ALTERATION DURING THE GROWTH STAGE IN PATHOGENIC FUNGUS, EPIDERMOPHYTON FLOCCOSUM
T. Yamada, R. Watanabe, Y. Nozawa, and Y. Ito Apr. 1984 19 p refs Transl. into ENGLISH from Shinkin to Shinkinsho (Japan), v. 19, no. 3, 1978 p 229-237 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-77440; NAS 1.15:77440) Avail: NTIS HC A02/MF A01 CSCL 06C

Qualitative and quantitative changes of lipid components during the growth stages were studied in E. floccosum. The acyl group components of total lipids of Trichophyton rubrum and Microsporum cookei were also examined. The lipids of E. floccosum amounted to approximately 4% of the dry cell weight. Neutral lipids mainly consisted of triglycerides and sterols, and major polar lipids were phosphatidylcholine, phosphatidylethanolamine, and an unknown lipid X. The fatty acids in tryglycerides and phospholipids were palmitic, palmitoleic, stearic, oleic, and linoleic acids. The unknown polar lipid X which appeared between phosphatidylethanolamine and cardiolipin on thin layer chromatography plates contained no phosphorus. There was no significant change in the fatty acid components of E. floccosum and T. rubrum during the cell growth, whereas profound changes occurred in M. cookei. The sterol components of E. floccosum showed striking changes depending on the growth stage. Author

N85-16422*# National Aeronautics and Space Administration, Washington, D. C.
THE DEVELOPMENT OF THE VESTIBULAR APPARATUS UNDER CONDITIONS OF WEIGHTLESSNESS
Ya. A. Vinnikov, O. G. Gazenko, D. V. Lychakov, and L. R. Palmbakh Aug. 1984 27 p refs Transl. into ENGLISH from Zh. Obshchey Biol. (USSR), v. 44, no. 2, 1983 p 147-163
(Contract NASw-3541)
(NASA-TM-77517; NAS 1.15:77517) Avail: NTIS HC A03/MF A01 CSCL 06C

A series of experiments has been carried out on the effect of space flight conditions on morphogenesis and the structure of the vestibular apparatus in amphibian and fish larvae. Larval development proceeded in weightlessness without serious morphological defects. The vestibular apparatus developed; its organization in the experimental animals did not differ qualitatively from that in the controls. The specific external stimulus (gravitation) appears not to be a necessary condition for the development of a gravitation receptor in ontogenesis although the appearance of the vestibular apparatus in phylogenesis was apparently related to this stimulus. Author

N85-16423# Army Research Inst. of Environmental Medicine, Natick, Mass.
AN ATROPINIZED HEAT-STRESSED RAT MODEL: DOSE RESPONSE EFFECTS AND PHARMACOKINETICS
C. B. Matthew, R. W. Hubbard, and R. P. Francesconi Oct. 1984 24 p
(DA Proj. 3M1-62734-A-875)
(AD-A146851; USARIEM-M3/85) Avail: NTIS HC A02/MF A01 CSCL 06/15

Atropine and other anticholinergic drugs are widely used in common medications such as antihistamines and tranquilizers as well as in the treatment of organophosphate poisoning. Since atropine administration inhibits thermoregulatory efficiency in the heat in both man and the rat by reducing sweating and salivation respectively, we sought to quantitate the effects of atropine in our rat heatstroke model. Using this sedentary, heat-stressed rat model, we have determined that atropine increases the heating rate up to 3h after drug administration and that this elevation in heating rate is dose-dependent over the range from 10-1000ug/kg. The clinically used human dosages of atropine fall well within this range. GRA

N85-16424# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
EFFECTS OF LOW TEMPERATURES ON THE GROWTH AND UNFROZEN WATER CONTENT OF AN AQUATIC PLANT
A. J. Palazzo, A. R. Tice, J. L. Oliphant, and J. M. Graham Jun. 1984 15 p
(AD-A147107; CRREL-84-14) Avail: NTIS HC A02/MF A01 CSCL 06/3

Two laboratory studies were performed to investigate the effects of low temperatures on the aquatic weed plant Ceratophyllum dimersum L. Whole plants were subjected to low-temperature treatments of +4 deg, 0 deg and -6 deg C for 48 hours, and regrowth was compared to an untreated control. The control and +4 deg C-treated plants gained weight, while visible injury and reductions in plant biomass were noted 30 days after treatment at the two lower temperatures. The -6 deg C treatment killed the plants, while the 0 deg C treatment injured them to some degree. In another phase of this study, nuclear magnetic resonance (NMR) analysis of plant buds, leaves and stems showed that lowering temperatures caused the plants' unfrozen water content to drop rapidly as the temperature approached -5 deg C, then slowly as temperatures approached -13 deg C. From -13 deg C to -22 deg C there was little change in unfrozen water content. The results show that ice in this plant causes injury that affects subsequent regrowth; temperatures of -6 deg C or below can actually kill them. This killing temperature was also near the point where frozen water content increased only slightly with lower temperatures. NMR analysis could be one way of determining plant tolerance to cold. It appears from this study that this weedy species is susceptible to low-temperature injury, and subjecting this plant to cold may be a promising method of weed control in northern lakes. GRA

N85-16425# California Univ., Irvine, Dayton, Ohio. Toxic Hazards Research Unit.
[TOXIC HAZARDS RESEARCH] Annual Technical Report, Jun. 1983 - Jun. 1984
J. D. MacEwen and E. H. Vernot Wright-Patterson AFB, Ohio AMRL Sep. 1984 212 p
(Contract F33615-80-C-0512)
(AD-A147857; AFAMRL-TR-84-001; NMRI-TR-84-42; ATR-21) Avail: NTIS HC A10/MF A01 CSCL 06/20

The research program of the Toxic Hazards Research Unit (THRU) for the period of June 1983 thrugh May 1984 is reviewed. Chronic toxicity and oncogenic studies were carried out with hydrazine, JP-4 and JP-8. A series of acute toxicity studies was conducted on a variety of chemicals and chemical agents used by the Army, Air Force, and Navy. Neurotoxicity and subchronic

inhalation studies were conducted on several hydraulic fluids and lubricants. GRA

N85-16426# Joint Publications Research Service, Arlington, Va.
USSR REPORT: LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES
27 Dec. 1984 159 p Transl. into ENGLISH from various Russian articles
(JPRS-UBB-84-027) Avail: NTIS HC A08

The following topics are considered: aerospace medicine, agriculture, biochemistry, bionics, biophysics, epidemiology, and genetics. In addition, immunology, laser applications, microbiology, and radiation effects are addressed. Research in pharmacology, toxicology, physiology, public health, and radiobiology is also reported. For individual titles, see N85-16427 through N85-16441.

N85-16427# Joint Publications Research Service, Arlington, Va.
DISTINCTIONS OF SPF RATS USED IN EXPERIMENTS ABOARD BIOSATELLITES
N. N. Lizko, V. I. Korolkov, L. N. Petrova, V. M. Shilov, V. N. Frolov, and L. V. Serova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPS-UBB-84-027) 27 Dec. 1984 p 1-4 Transl. into ENGLISH from Vestn. Selskokhozyaystvennoy Nauki (Moscow), no. 8, Aug. 1984 p 123-126 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

Before performing experiments aboard biosatellites, the intestinal microbiocenosis of 100 SPF rats was studied in order to pursue dynamic observation of changes in intestinal microflora from the time the animals arrived in the vivarium to the start of the flight. Results indicate marked microbial contamination in the first ten days in the vivarium. It was the most active with regard to gram-negative bacteria. Changes in intestinal microflora of SPF animals were investigated in three experiments aboard Cosmos satellites. The main distinction of intestinal microflora in SPF animals was the stability of lactoflora, which was demonstrated in most rats. Lactofloral resistance to extreme conditions aided the SPF rats in responding favorably to space flight stress. R.S.F.

N85-16428# Joint Publications Research Service, Arlington, Va.
EYES FOR COMPUTERS Abstract Only **c60**
L. Pilman *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 36 Transl. into ENGLISH from Kom. Tadzhik. (USSR), 5 Sep. 1984 p 3 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The development of a functional model of the human eye is described. The device has a distinctive pupil and light guides transmitting an image on a television screen which serves as a retina. Possible applications of the eye in astrophysics, medicine, and underwater optics are discussed. R.S.F.

N85-16429# Joint Publications Research Service, Arlington, Va.
MODELING OF HUMAN MOTION BY COMPUTER CONSIDERING MEASUREMENT ERRORS IN INITIAL DATA Abstract Only **c54**
A. V. Zinkovskiy and V. A. Chistyakov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 37 Transl. into ENGLISH from Biofiz. (Moscow), v. 29, no. 4, Jul. - Aug. 1984 p 694-695 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The statistical characteristics of joint moments were analyzed when there were errors in the mass-inertia characteristics of a biomechanical system and errors arising upon recording and computation of the kinematics of motion. In addition, statistical characteristics of the synthesized motion on a computer were studied when there were errors in joint moments which appeared due to the finite word length of the digital computer. Assuming randomness and independence of errors in determination of the inertial tensors, the dispersions of errors in joint moments are found. With errors arising due to inaccurate knowledge of kinematics of the moving biomechanical system, a method of Gaussian approximation was used to filter errors of measurement. R.S.F.

N85-16430# Joint Publications Research Service, Arlington, Va.
VARIATION IN PHOTOSYNTHESIS WITH LIGHT LEVEL FOR MODEL WITH TWO PHOTOCHEMICAL REACTIONS Abstract Only
V. I. Zvalinskiy and F. F. Litvin *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 38 Transl. into ENGLISH from Biofiz. (Moscow), v. 29, no. 4, Jul. - Aug. 1984 p 542-547 (For primary document see N85-16426 07-51)
Avail: NTIS HC 08

A model was developed previously describe the variation in the rate of photosynthesis for one of two photochemical reactions as a function of light intensity. The influence of the different organization of photosynthetic units and the limiting dark reaction accompanied by a reaction center cycle was considered in this model. This approach is extended herein to allow analysis of the light dependence of photosynthesis considering both photochemical reactions. The shape of the light curve is indepenent of the location of the link which limits the speed of the dark reaction with respect to the two light reactions. It is determined only by the relative resistance of this link with respect to the total resistance of dark reactions in the reaction center cycles. The form of the light curves should depend on the degree of interaction of the two photosystems, that is, the degree of balance of excitation of the two photosystems. The form of the light curve should also depend on the spectral composition of the light. Author

N85-16431# Joint Publications Research Service, Arlington, Va.
EFFECT OF MICROWAVE RADIATION ON LOCAL BLOOD CIRCULATION AND OXYGENATION OF BRAIN TISSUE Abstract Only **c52**
N. P. Mitagvariya and Kh. I. Bicher *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 82 Transl. into ENGLISH from Byul. Eksperim. Biol. i Med. (Moscow), no. 7, Jul. 1984 p 37-39 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The clinical use of microwaves has grown recently in importance. Microwaves have been shown to cause hyperoxia and to change brain tissue reaction to pure oxygen. Local blood circulation in the brain as well as oxygen dynamics were studied in 53 test rabbits. Arterial pressure was measured by catheter, while brain blood flow was recorded in various regions of the brain. Microwaves generated by a Raytheon magnetron were administered to determine their effect on these parameters. Immediate fall in blood flow to the brain was quickly followed by an increase. The changes were attributed to the heat effects of the microwaves. The medulla oblongata was also exposed to microwaves. Here only brief exposure caused up to 250% increases in blood flow and 130% increases in oxygen pressure. Microwaves were found to have strong effects on brain blood flow regardless of hyperthermic effects. R.S.F.

N85-16432# Joint Publications Research Service, Arlington, Va.
HIGH VOLTAGE EFFECTS MEASURED ON DUMMY MANNEQUIN **c52**
S. Shpungin *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 101 Transl. into ENGLISH from Sov. Kirgiziya (USSR), 14 Sep. 1984 p 3 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

A mannequin equipped with remote control instruments was developed to determine the level of effects which electric fields of high voltage equipment produce on persons nearby such equipment. Instruments register weak currents which occur. Pickups, an amplifier, a switch, and other devices are concealed within the mannequin. An operator commands them from a remote control unit. Information is analyzed by a microcomputer, which calculates the intensity of the electric field on various sections of the mannequin's surface. Such information is needed for medical-

biological research. The testing of antistatic suits is one possible application of this innovation along with improving industrial safety in the proximity of high voltage electric fields. R.S.F.

N85-16433# Joint Publications Research Service, Arlington, Va.
NATURAL ELECTRICAL ACTIVITY OF HUMAN SYMPATHETIC NERVE FIBERS, RECORDED FROM BODY SURFACE Abstract Only c52
V. V. Gerzanich, Yu. S. Lusaychuk, I. N. Remizov, and V. I. Skok *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 103-104 Transl. into ENGLISH from Fiz. Zh. Imeni I. M. Sechenova (Leningrad), v. 70, no. 5, May 1984 p 589-593 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

Sympathic nerve fiber activity from the surface of the skin was recorded without using transcutaneous electrodes. Coherent accumulation of signals synchronous with the cardiac rhythm was used to separate the signal from noise. The recorded electrical wave is a flow potential or other phenomenon of physical origin related to the blood circulation. During the cardiac cycle, in which the electrogram records component II, which is absent in the denervated extremity, the rheogram of the denervated extremity is no different from that of the normal extremity. The propagation rate of the rheogram component which arises in the normal and is absent in the denervated extremity corresponds in time to the development of component II of the electrogram, considering the difference in the rate of recording of the two reactions. It is shown that component II of the electrogram taken from the surface of the forearm by coherent accumulation of the pulse rhythm does reflect tonic sympathetic nerve activity. E.A.K.

N85-16434# Joint Publications Research Service, Arlington, Va.
DISTRIBUTION OF BLOOD FLOW TO BRAIN, KIDNEYS, GUT, SPLEEN AND POSTERIOR EXTREMITIES IN CATS IN ACUTE HYPOXIA Abstract Only
B. B. Iripkhanov, A. I. Krivchenko, and Yu. Ye. Moskalenko *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 106 Transl. into ENGLISH from Fiz. Zh. Imeni I. M. Sechenova (Leningrad), v. 70, no. 5, May 1984 p 728-731 Original language document was announced in IAA as A84-40698 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

Experiments performed on cats indicate that a particular type of adaptive reaction occurs in the cardiovascular system during acute hypoxia. This type of reaction is directed toward compensation of oxygen deficiency, primarily in the most vital organs. This occurs as a consequence of differences in the sensitivities of vessels of different organs to arterial PO2, which makes possible the redistribution of blood during acute hypoxia. B.J.(IAA)

N85-16435# Joint Publications Research Service, Arlington, Va.
CENTRAL REGULATION OF SENSORY FLOW IN HUMAN VISUAL SYSTEM Abstract Only c52
A. M. IVanitskiy, I. A. Korsakov, and V. L. Tatko *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 107 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 339-346 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

Bilateral stimulation through light guides were given to 21 human subjects. Evoked potentials in response to various intensities of light flashes were recorded under the control of a French computer. The subjects pressed a button in resopnse to a given sequence of flashes. It is found that instructions given before the experiments influence the perception of the subjects and the experimental instructions were intensionally incorrect. Evoked potentials corresponded to the expected stimulus rather than the actually presented stimulus. Failure to notice changes in intensity which was correctly predicted in the instructions, resulted from spontaneous fluctuations in perceptive characteristics of the visual analyzer. E.A.K.

N85-16436# Joint Publications Research Service, Arlington, Va.
LATERAL SPECIFICS OF VISUAL PERCEPTION Abstract Only c52
N. G. Manelis and N. V. Grebennikova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 107-108 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 347-351 Original language document was announced in IAA as A84-38502 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The visual recognition of geometrical figures by the left and right hemispheres was investigated in 10 healthy right-handed persons 25 to 45 years of age. This tachistoscope study involved the recognition of simple figures (e.g., a square or triangle) and double figures (e.g., a square within a square). An error analysis shows that the right hemisphere was more successful than the left one in recognizing the double figures. The most common error of the left hemisphere was to perceive the double figure as a simple one. It is suggested that the left hemisphere first perceives the outer shape of the figure and then perceives the presence of an inner figure. B.J.(IAA)

N85-16437# Joint Publications Research Service, Arlington, Va.
VISUAL EVOKED POTENTIALS WITH DISRUPTED FUNCTIONING OF NONSPECIFIC CEREBRAL SYSTEMS Abstract Only c52
M. L. Sklovskaya and A. I. Ishmukhametov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 108 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 352-357 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

Visual evoked activity to examine the influence of damage to nonspecific brain stem structures was studied. Studies were performed on 32 patients with closed skull brain trauma 1 to 2 days after injury, and on 37 healthy test subjects. The EKG and evoked visual potentials were recorded. An increase in the time peak latency of all components of evoked potentials among the accident victims are observed. A significant bilateral increase in amplitude of H3 component was characteristic for most subjects. Changes were observed in the late components of the visual evoked potentials. The nature of amplitude changes in late components was mixed; the increase in H3 component was accompanied by a decrease in P4 and H4. It is suggested that the change in amplitude time characteristics of these components are electrographic reflections of disruptions of normal interrelationships in the limbic and reticular systems of the brain. E.A.K.

N85-16438# Joint Publications Research Service, Arlington, Va.
CHANGE IN RELATIONSHIP OF BIOPOTENTIALS OF BRAIN ZONES FOR VARIOUS LEVELS OF WORKING CAPACITY Abstract Only c52
Yu. A. Petrov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 109-110 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 370-374 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The specifics of space-time relationships of cerebral biopotentials in the process of physical activity were studied. Highly qualified sportsmen with various sports specialities were tested. Changes in cortical activity were studied by correlation and coherent analysis of EEG. Restructuring of the spectral composition of the EEG and coherence of cortical potentials in the subjects at various times during the experiments are shown. Increases in intercentral correlations and coherence wre observed are shown. At the initial moments of development of fatigue, the number of high correlation coefficients of potentials was 1.8 times higher than in the acute stage. In noncyclists, there were higher level of intercentral correlation and greater growth in distances of maximum coherence of EEG, particularly between precentral and prefrontal areas than in cyclists who were more accustomed to the type of exercise. E.A.K.

N85-16439# Joint Publications Research Service, Arlington, Va.
PULMONARY BLOOD FLOW AND OXYGENATION OF ARTERIAL BLOOD IN A HEALTHY SUBJECT UPON 7 DAYS HYPOKINESIA Abstract Only c52
E. M. Nikolayenko, V. Ye. Katkov, S. V. Gvozdev, V. V. Chestukhin, and M. I. Volkova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 110 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 421-425 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The dynamics of change of oxygenation of arterial blood, as well as general and regional profusion of the lungs during 7 days antiorthostatic hypokinesia were studied. Thirty to 40 minutes after a healthy subject moved from a horizontal position to the antiorthostatic position, oxygenation of the arterial blood drops continuing, up to the third day. This drop in P sub O2 results from an increase in the alveolo-arterial PO2 gradient. The summary pulmonary blood flow at minus 15 deg remains unchanged, but is redistributed. Blood flow inreases in the zones in the lungs which receive air from the dead space. It is decreased in zones which receive fresh gas, and decreases ventilation effectiveness which causes an increases in alveolar ventilation. Arterial hypoxemia results from displacement of the log-normal distribution of the ventilation-profusion relationships both in the direction of lower and in the direction of higher values, which cannot be explained as being caused by the gravitational factor alone. E.A.K.

N85-16440# Joint Publications Research Service, Arlington, Va.
SPECIFICS OF DYNAMICS OF BRAIN BIOPOTENTIALS UNDER THE INFLUENCE OF COMPLEX AUDIBLE COMMUNICATIVE SIGNALS c52
L. P. Novitskaya *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 111 Transl. into ENGLISH from Fiziol. Cheloveka (Moscow), v. 10, no. 3, May-Jun. 984 p 469-471 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

The specifics in the dynamics of the functional status of the brain under the influence of complex communicative audio signals based on spatial relationships of summary EEG energy and data on local and diffuse changes in its interhemispheric distribution were studied. Studies involved nomopolar recording of EEG within an 8 channel electroencephalograph. The correlation coefficient was calculated by the Breinstein equation to estimate spatial relationships of bioelectric activity. Local and diffuse changes in spatial distribution of the integral summary EEG energy were estimated by calculating the percent relationship of absolute values of these indicators during the second 30 seconds of each minute. Classical music increased the probability of appearance of significant positive correlation coefficients between the temporal areas of the two hemispheres and between the central and temporal areas of the right hemisphere. Rock and disco music decreased the probability of significant positive correlation coefficients. Data indicate different nature of the space-time changes in bioelectric activity of the brain as a function of the type of signal received. E.A.K.

N85-16441# Joint Publications Research Service, Arlington, Va.
BIOCHEMICAL EVALUATION OF BODILY INFLUENCE OF HIGH AND LOW TEMPERATURES Abstract Only c52
A. I. Barkalaya and M. A. Verkhotin *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 111-112 Transl. into ENGLISH from Gigiyena Tr. i Prof. Zabolevaniya (Moscow), no. 3, Mar. 1984 p 31-34 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

Physical work was performed at a moderate rate in a climate chamber at 30 to 100 deg C, relative humidity 75%. At temperatures over 50 deg C, a suit with a water tube cooling system was used. Six low temperature observations were performed in water at 4 to 5 deg C, with some of the volunteers in a heated wet suit. Blood, lactate dehydrogenase activity was studied. It was noted that high temperatures increase activity and cause skeletal muscle and myocardial hypoxia. Cooling raised the LDH activity only slightly. It is found that it is possible to record indirectly the reaction of dissociation of oxidative phosphorylation and consequently the degree of adaptive muscle thermogenasis. E.A.K.

52 AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and weightlessness.

N85-16442 Department of the Air Force, Washington, D.C.
METALLIC AID AND TECHNIQUE IN FITTING VOICE PROSTHESIS Patent
E. Cantu, inventor (to Air Force) Issued 14 Aug. 1984 4 p Supersedes AD-D009700
(AD-D011356; US-Patent-4,465,068; US-Patent-Appl-SN-394945; US-Patent-Class-128-303) Avail: US Patent and Trademark Office CSCL 06/12

A metallic insert for use in radiographically fitting a voice prosthesis to a post-laryngectomy patient is described which comprises an elongate, generally cylindrically shaped cast metal member sized to fit snugly within the housing of a dummy prosthesis whereby the fit of the prosthesis can be accurately assessed radiographically in minimum time and with optimal fit to the individual patient. GRA

N85-16443# Naval Medical Research Inst., Bethesda, Md.
PATHOGENESIS AND TREATMENT OF CEREBRAL AIR EMBOLISM AND ASSOCIATED DISORDERS Final Report
P. W. Catron, J. M. Hallenbeck, E. T. Flynn, M. E. Bradley, and D. E. Evans Apr. 1984 63 p
(AD-A146723; NMRI-84-20) Avail: NTIS HC A04/MF A01 CSCL 06/5

A comprehensive discussion of the pathogenesis and treatment of cerebral air embolism and associated disorders is presented. Included are recommendations for diagnostic and therapeutic equipment and drugs to be available both inside and outside of the recompression chamber, and detailed rationales and schemata for administering therapy. GRA

N85-16444# Letterman Army Inst. of Research, San Francisco, Calif.
FATAL HEMORRHAGIC SHOCK AND ACETATE SOLUTIONS Final Report, Jan. - Apr. 1984
L. W. Traverso, W. P. Lee, M. J. Langford, and L. D. Witcher Aug. 1984 32 p
(AD-A146754; LAIR-181) Avail: NTIS HC A03/MF A01 CSCL 06/5

One-half of deaths among trauma victims occur within 1 hour of injury and are due to rapid hemorrhage or CNS trauma. We developed a rapid hemorrhage model in unanesthetized swine to simulate human exsanguination. We compared the ability of four crystalloid solutions to prevent death after an otherwise fatal hemorrhage; normal saline (NS), Ringer's lactate (RL), Plasmalyte-A (PA), and Plasmalyte-R (PR). Five days before hemorrhage swine received an aortic sideport and a central venous treatment catheter. Aortic blood (54ml/kg) was removed in 15 minutes from 116 swine. The percentage of shed blood replaced was 14 percent in 5 minutes with NS, 100 percent in 20 minutes with NS, and 300 percent in 30 minutes with NS, RL, PA, or PR. We found that all mortalities were determined within two hours after hemorrhage and that RL provided the best survival rate of 67 percent (NS 300%=50%, PR=40%, and PA=30%). After an analysis of arterial blood gas, lactate, acid-base, heart rate, and aortic pressure measurements, we conclude that RL is the superior crystalloid solution because of its decreased chloride load (as compared to NS) and because of the absence of acetate or magnesium (as compared to PA and PR). GRA

N85-16445# Naval Medical Research Inst., Bethesda, Md.
INDUCTION OF IMMUNITY TO TOXINS WITH ANTI-IDIOTYPIC

ANTIBODY Annual Report, 1 Feb. 1983 - 30 Sep. 1984
D. G. Sieckmann 1 Oct. 1984 22 p
(Contract N00014-83-AF-00001)
(AD-A146793; AR-1) Avail: NTIS HC A02/MF A01 CSCL 06/5

Anti-idiotypic antibodies (antibodies directed at the combining site of an antibody molecule) are being tested in a new method for safe and efficient vaccination to substances which are too toxic for direct inoculation. Exotoxin A, an extracellular toxin produced by Pseudomonas aeruginosa is being used as the model toxic substance. A panel of monoclonal mouse antibodies to exotoxin A were prepared in NMRI and balb/c mice, consisting of one IgG1, one IgA and six IgM hybridoma cell lines. Control monoclonals were developed from an existing panel of anti-rickettsia monoclonals of NMRI allotype. The monoclonals were purified by preparative centrifugation and column chromatography and were used to prepare anti-idiotypic antisera in mice and rabbits. High-titered anti-idiotypic antisera to one IgM anti-exotoxin monoclonal, TC-31, was raised in C57B1/6 mice. The antiserum was specific for TC-31 and noncross-reactive with the other monoclonals. High-titered anti-idiotypic antisera to each monoclonal have been prepared in rabbits. GRA

N85-16446# Naval Research Lab., Washington, D. C.
LIPOSOME-ENCAPSULATED HEMOGLOBIN FOR EMERGENCY RESUSCITATION Annual Report, 1 Oct. 1983 - 30 Sep. 1984
M. C. Farmer and B. P. Gaber 1 Oct. 1984 12 p
(RR0-4108)
(AD-A146794) Avail: NTIS HC A02/MF A01 CSCL 06/1

An oxygen-carrying resuscitation fluid has been developed based upon liposome-encapsulated hemoglobin (LEH). The hemoglobin so encapsulated carries oxygen with unimpaired efficacy. The LEH is stable in the presence of serum and red cells in vitro and displays rheological properties similar to red cells. When tested ex vivo, encapsulation provides some protection from the vasoconstrictive effects seen with stroma-free hemoglobin. In in vivo measurements the circulation persistence of LEH in mice exceeds a half lifetime of 6 hours, with animal survival extending beyond two months. An improved lipid formulation substitutes hydrogenated soy lecithin for dimyristoyl lecithin, providing a significant cost reduction and replaces dicetylphosphate with a negatively charged lecithin, to eliminate possible toxic effects. Preliminary data suggest that a major production scale-up can be achieved using commercially available equipment. GRA

N85-16447# Army Research Inst. of Environmental Medicine, Natick, Mass.
CAROTID BARORECEPTOR INFLUENCES ON PERIPHERAL CIRCULATORY AND THERMAL RESPONSES DURING COLD EXPOSURE
C. A. Ohata, G. D. Powers, and P. H. Scaglione 1984 34 p
(DA Proj. 3E1-62777-A-879)
(AD-A146808; USARIEM-M-1/85) Avail: NTIS HC A03/MF A01 CSCL 06/19

The effects of varying the pressure within a vascularly isolated carotid sinus on peripheral circulatory and thermal responses during hindlimb exposure to room air and cold were determined in anesthetized cats. A sigmoidal relationship between heart rate and carotid pressure was observed only during exposure to room air, suggesting that cold-induced somatosympathetic reflexes may override the carotid baroreflex effects on heart rate. At low carotid pressures, mean arterial pressure increased, femoral arterial vascular resistance decreased, femoral arterial blood flow increased, footpad thermal insulation decreased, footpad temperature increased, and footpad heat loss increased. Opposite responses were observed at high carotid pressures. These trends were observed during hindlimb exposure to both room air and cold. The persistence of baroreceptor effects on peripheral circulatory and thermal responses in a locally cold-exposed hindlimb provides evidence that cold-induced vasodilatory responses may be mediated by baroreceptor reflexes. GRA

N85-16448# Army Research Inst. of Environmental Medicine, Natick, Mass.
COMPARISON OF THERMAL RESPONSES BETWEEN REST AND LEG EXERCISE IN WATER
M. M. Toner, M. N. Sawka, W. L. Holden, and K. B. Pandolf 9 Oct. 1984 25 p
(DA Proj. 3E1-62777-A-879)
(AD-A146818; USARIEM-M2/85) Avail: NTIS HC A02/MF A01 CSCL 06/19

This study examined both the thermal and metabolic responses of individuals in cool (30 C, n=9) and cold (18 C, n=7; 20 C, n=2) water. Male volunteers were immersed up the neck for 1 h during both seated rest (R) and leg exercise (LE). In 30 C water, metabolic rate (M) remained unchanged over time during both R (115 W, 60 min) and LE (528 W, 60 min). Mean skin temperature (Tsk) declined ($P<0.05$) over 1 h during R, while Tsk was unchanged during LE. Data indicated that LE is more effective than R in maintaining core temperatures in both cool and cold water. Also, immersion in cold water elicits differing core temperatures indicating that chest cavity temperature is maintained at a higher level than other core areas. GRA

N85-16449# Southwest Research Inst., San Antonio, Tex. Engineering Sciences Div.
A CREW EXPOSURE STUDY. VOLUME 1: OFFSHORE Final Report, on Phase 2
W. J. Astleford, L. S. Bay, T. B. Morrow, R. H. Pish, and J. P. Riegel Jun. 1984 205 p 2 Vol.
(Contract DTCG23-80-C-20015)
(AD-A146884; Rept-06-6177-Vol-1; USCG-D-21-84) Avail: NTIS HC A10/MF A01 CSCL 06/10

The objective of this project was to implement the Phase 1 test plan for characterizing occupational exposures of offshore facility workers to chemical substances and selected physical agents. This report documents the measurement and monitoring data that were collected during a 7-day period on drilling and production facilities. Respirable and total dust/fume exposures were monitored during mud makeup operations, welding and rust/paint chipping. Sound pressure level contour maps were generated for seven platforms and two rigs. Personal noise dosimetry data were collected during drilling and tripping, addition of drilling fluid chemicals and maintenance/repair activities. Occupational exposures to dusts and fumes were evaluated relative to ACGIH exposure limits. Noise dosimetry data were interpreted relative to the exposure guidelines in USCG Navigation and Vessel Inspection Circular (NVC 12-82). The study concluded that exposures to the airborne substances were acceptable for the materials and operations that existed during the 7-day observation. Additional monitoring would be needed to assess other drilling muds and mud chemicals that were not observed. Noise data obtained on this study indicate the need for initiating or maintaining hearing conservation programs. Author (GRA)

N85-16450# Army Research Inst. of Environmental Medicine, Natick, Mass.
EFFECTS OF RESTRICTED WATER INTAKE ON PERFORMANCE IN A COLD ENVIRONMENT
D. E. Roberts, J. F. Patton, J. W. Pennycook, M. J. Jacey, and D. V. Tappan 1 May 1984 29 p
(AD-A146904; USARIEM-T-2/84) Avail: NTIS HC A03/MF A01 CSCL 06/19

Eighteen male subjects were housed for 10 days in an environmental chamber maintained at 70 F for the first 3 days and then lowered to -10 F for the next 5 days and maintained at 70 F for the last 2 days. Subjects received a standard ration containing 4500 kcal and either 1.5L (Group 1) or 3.0L (Group 2) of water per day beginning on the first cold day. All subjects were slightly dehydrated (2% BW) prior to cold exposure. After exposure, the weight loss for Group 1 was 3.49 + or - 0.35% BW ($p < .05$) while Group 2 regained most of their initial loss and was down only .14 + or - 0.35% BW. There was no significant difference in the groups' ability to perform endurance tests, but Group 1 showed a significant degree of hand cooling ($p < .01$). These data indicate that exercise can be performed satisfactorily even when subjects are not well hydrated, but their response to

environmental conditions is adversely affected. The data further indicate that a person can function and remain hydrated on 3.0L water/day under severe conditions. GRA

N85-16451# Naval Biodynamics Lab., New Orleans, La.
NICHOLET MED-80 (TRADEMARK) PROGRAMS IN THE NAVAL BIODYNAMICS LABORATORY EVOKED POTENTIAL SERIES
R. E. Tabler, Jr. Jul. 1984 78 p
(AD-A147105; NBDL-84R007) Avail: NTIS HC A05/MF A01 CSCL 06/19

This report gives complete documentation and listings for five computer programs developed at the Naval Biodynamics Laboratory to record, analyze, and plot evoked potential data using the Nicolete Med-80 computer. The programs are: EPPROG, PERDAT, EPDATA, PLOTEP, and LSTPER. Appendices include: wiring for the Med-80, flowcharts for all programs, and printouts of all programs. GRA

N85-16452# Naval Ocean Systems Center, San Diego, Calif.
MILITARY VITAL SIGN MONITOR Final Technical Report, 15 Feb. - 30 Jul. 1984
R. W. Kataoka and F. R. Borkat 30 Sep. 1984 39 p
(M09-93)
(AD-A147257; NOSC/TR-992) Avail: NTIS HC A03/MF A01 CSCL 06/12

The investigation of commercial vital monitoring devices for use aboard Navy/Marine Corps helicopters is summarized. Army and Air Force activity in test area, as well as NATO requirements, are presented. Finally, generalized military testing procedures are identified for medical equipment used aboard aircraft. GRA

N85-16453# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
TESTING CHANGES IN VISUAL FUNCTION DUE TO ORBITAL ENVIRONMENT Final Report
L. V. Genco and H. L. Task Jan. 1984 42 p
(AF Proj. 6893; AF Proj. 7184)
(AD-A147259; AFAMRL-TR-84-049) Avail: NTIS HC A03/MF A01 CSCL 06/16

The effects of weightlessness and other space environmental conditions on vision have received little attention since the visual acuity experiments performance by Dr. Duntley, circa 1968. Although several subsequent investigators have attempted to construct vision testers suitable for use in space, none was fully successful until the production of the device described in this report. The report describes a device submitted by the AF Aerospace Medical Research Laboratory for inclusion aboard several NASA Shuttle Flights, in an attempt to detect and quantify certain changes in visual performance caused by the environmental conditions experienced while in Earth orbit. GRA

N85-16454# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
NEURO-LINGUISTIC PROGRAMMING: EYE MOVEMENTS AS INDICATORS OF REPRESENTATIONAL SYSTEMS M.S. Thesis
W. H. Moore and G. A. Powell Sep. 1984 79 p
(AD-A147541; AFIT/GLM/LSM/84S-48) Avail: NTIS HC A05/MF A01 CSCL 05/10

The experiment documented in this thesis investigated the eye movement hypothesis of the Neuro-Linguistic Programming model by testing the initial and dominant eye movements of forty-three male, right handed subjects against two methods of determining representational systems: the categorization of verbal responses and the selection of written descriptors, both in response to stimulus cues. Chi squared contingency tables were used to test dependency. Neuro-Linguistic Programming was developed by Richard Bandler and John Grinder. It is a model of human communications and behavior which claims that people organize and access information using representational systems. These systems are based on sensory modes, primarily auditory, visual, and kinesthetic. According to the model, specific eye movements are associated with, and are indicators of these representational systems. In this study, verbal responses were found to be dependent upon dominant eye movement statistically significant to the .10 level (X squared = 8.5385, 4d.f.). No correlation was found between dominant eye movement and the selection of written descriptors or between initial eye movements and either verbal response or descriptor selection. GRA

N85-16455# Army Research Inst. of Environmental Medicine, Natick, Mass.
EFFECTS OF BODY MASS AND MORPHOLOGY ON THERMAL RESPONSES IN WATER
M. M. Toner, M. N. Sawka, M. E. Foley, and K. B. Pandolf 30 Oct. 1984 24 p
(AD-A147558; USARIEM-M6/85) Avail: NTIS HC A02/MF A01 CSCL 06/16

Ten male volunteers were divided into two groups based on body size and weight. The large body mass (LM) group (n=5) was 16.3 Kg heavier and 24 sq. m/kg. smaller in surface area-to-weight ratio ($P<0.05$) than the small body mass group (n=5). Both groups were similar in total body fat and skinfold thicknesses ($P>0.05$). All individuals were immersed for 1 h in water at 26 deg C during both rest and one intensity of exercise. During resting exposures, metabolic rate, mean-heat flow, and rectal temperature were not different ($P>0.05$) between the LM and SM groups at min 60. Esophageal temperature was higher ($P<0.05$) for the SM groups at min 60, though the change in Esophageal temp during the 60 min between groups was similar (LM, -0.4 deg C; SM, -0.2 deg C). Similarly during exercise the above data were not different ($P>0.05$) between groups at min 60. These data illustrates that moderate differences in body size and weight between individuals from a given population do not effect thermal responses in water. Also, studies contrasting dissimilar populations such as men and women should consider alternative explanations for differing thermal responses when body size differences are of similar magnitude as presently reported. GRA

N85-16456# Chrysler Corp., Huntsville, Ala. Military-Public Electronic Systems.
IMPROVED RADIOGRAPHIC VIEWING SYSTEM Final Summary Report, 15 Jan. 1983 - 15 Apr. 1984
E. W. George and L. M. Perry 6 Apr. 1984 75 p
(Contract DAMD17-83-C-3006; DA Proj. 3S4-64717-D-832)
(AD-A147587) Avail: NTIS HC A04/MF A01 CSCL 06/12

An improved radiographic viewing system was developed for field medical X-ray applications. This effort began with research on state-of-the-art technology in X-ray to light conversion screens (especially fiber optic scintillators), image intensifiers, and detectors. The findings of this research were used to design a radiographic camera which was then constructed and tested. It is lightweight, compact, rugged, with good resolution and sensitivity. GRA

N85-16457# Oregon State Univ., Corvallis. Environmental Health Science Center.
CHEMICAL PROTECTION AGAINST IONIZING RADIATION Final Report
J. C. Livesey, D. J. Reed, and L. F. Adamson Aug. 1984 161 p
(Contract EMW-E-0883)
(AD-A147822; UCRL-15644) Avail: NTIS HC A08/MF A01 CSCL 06/18

The scientific literature on radiation-protective drugs is reviewed. Emphasis is placed on the mechanisms involved in determining the sensitivity of biological material to ionizing radiation and mechanisms of chemical radioprotection. In Section 1, the types of radiation are described and the effects of ionizing radiation on biological systems are reviewed. The effects of ionizing radiation are briefly contrasted with the effects of non-ionizing radiation. Section 2 reviews the contributions of various natural factors which influence the inherent radiosensitivity of biological systems. Included in the list of these factors are water, oxygen, thiols, vitamins and antioxidants. Brief attention is given to the model describing competition between oxygen and natural radioprotective substances (principally, thiols) in determining the net cellular

radiosensitivity. Several theories of the mechanism(s) of action of radioprotective drugs are described in Section 3. These mechanisms include the production of hypoxia, detoxication of radiochemical reactive species, stabilization of the radiobiological target and the enhancement of damage repair processes. Section 4 describes the current strategies for the treatment of radiation injury. Likely areas in which fruitful research might be performed are described in Section 5. GRA

N85-16458# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
VISION BY MAN AND MACHINE: HOW THE BRAIN PROCESSES VISUAL INFORMATION MAY BE SUGGESTED BY STUDIES IN COMPUTER VISION (AND VICE VERSA)
T. Poggio Mar. 1984 14 p
(Contract N00014-80-C-0505)
(AD-A147890; AI-M-776) Avail: NTIS HC A02/MF A01 CSCL 06/16

The development of increasingly sophisticated and powerful computers in the last few decades has frequently stimulated comparisons between them and the human brain. Such comparisons will become more earnest as computers are applied more and more to tasks formerly associated with essentially human activities and capabilities. The expectation of a coming generation of intelligent computers and robots with sensory, motor and even intellectual skills comparable in quality to our own is becoming more widespread and is leading to a new and potentially productive analytical science of information processing. In no field has this new approach been so precisely formulated and so thoroughly exemplified as in the field of vision. As the dominant sensory modality of man, vision is one of the major keys to our mastery of the environment and to our understanding and control of the objects which surround us. If we wish to create robots capable of performing complex manipulative tasks in a changing environment, we must surely endow them with (among other things) adequate visual powers. How can we set about designing such flexible and adaptive robots? In designing them, can we make use of our rapidly growing knowledge of the human brain, and if so, how at the same time, can our experience in designing artificial vision systems help us to understand how the brain analyzes visual information? GRA

N85-16459# Department of the Air Force, Washington, D.C.
RANDOM PATTERN TRACKING ACCELERATION TOLERANCE TESTER Patent Application
D. W. Repperger, inventor (to Air Force) Filed 29 Aug. 1984 43 p
(AD-D011404; US-Patent-Appl-SN-645390) Avail: NTIS HC A03/MF A01 CSCL 06/19

A G force acceleration effects monitoring apparatus involving a pair of LED or other visual stimulus arrays, one randomly patterned by an electronic driving apparatus and one patterned by the manipulation of a G force test subject. The electronic driving apparatus preferably includes a sum of sines algorithm and the test subject manipulation are received preferably from a joystick controller. Mounting of the apparatus in a centrifuge gondola and also in off-line training stations and use of the invention by animals are also disclosed. This invention relates to the field of G force acceleration effect sensing accomplished by way of visual field and psychomotor tracking performance evaluation in a test subject. When a human subject is exposed to increasing G force acceleration, a well-established sequence of degradation changes in the subject's blood circulation occur. GRA

N85-16460# Technical Research Centre of Finland, Espoo. Ydinvoimatekniikan Lab.
ASSESSMENT OF RADIATION DOSAGES OBTAINED BY INTAKE OF RADIOACTIVE FALLOUT CONTAMINATED FOOD [RADIOAKTIIVISESTA LASKEUMASTA RAVINNON KAUTTA AIHEUTUVIEN SAETEILYANNOSTEN ARVIOINTI]
Rhea Kakko and Jouni Partanen Aug. 1984 62 p refs In FINNISH
(VTT-292; ISBN-951-38-2109-9; ISSN-0358-5077) Avail: NTIS HC A04/MF A01

The sub-program Agricultural Doses (Agrid) was constructed as part of the Assessment of Risks of Accidents and Normal Operation (Arano)-program. It is based on the Foodchain Transfer Module in the Methodology for Assessing the Radiological Consequenses of Accidental Releases (Food-Marc)-program, but it is simplified and enlarged taking into account the seasonal variations in Finland and five different agricultural products: vegetables, grain, beets, milk, and meat. Using Agrid, the effective doses obtained by each of the human intestines and the thyroid gland dose obtained by milk intake may be assessed.
Author (ESA)

N85-16461# National Inst. of Health, Bethesda, Md. Natl. Inst. of Arthritis, Diabetes, and Digestive and Kidney Diseases.
EVALUATION OF THE MUSCULOSKELETAL DISEASES PROGRAM Final Report
Stephen L. Gordon Mar. 1984 218 p
(PB84-230648; NIADDK-80/301; NIH/PUB-84-109) Avail: NTIS HC A10/MF A01 CSCL 06E

The evaluation was conducted in order to assess the effectiveness of the goals, performance and managerial approaches of a Musculoskeletal Diseases Program so as to help provide a foundation for improving research efforts. An assessment of the health care impact of selected medical technologies that were developed with program resources is given. The contractor convened evaluation groups (a Steering Committee and four Task Groups) having broad public and private membership in order to utilize their diverse expertise to determine evaluation strategy, select appropriate methodologies, establish a uniform format for all reports, define evaluation goals and procedures, and generate the final report. The resultant information is intended to provide a basis for those concerned with musculoskeletal diseases to help improve research and operational effectiveness. GRA

N85-16462# Professional Staff Association of the Rancho Los Amigos Hospital, Inc., Downey, Calif.
SHORT-TERM HUMAN RESPIRATORY EFFECTS OF NITROGEN DIOXIDE: DETERMINATION OF QUANTITATIVE DOSE-RESPONSE PROFILES. PHASE 2: EXPOSURE OF ASTHMATIC VOLUNTEERS TO 4 PPM NO2 Final Report
William S. Linn and Jack D. Hackney 18 May 1984 65 p refs Sponsored by Coordinating Research Council, Inc.
(PB85-104388/GAR; CRC-CAPM-48-83-02) Avail: NTIS HC A04/MF A01 CSCL 06T

Twenty-three asthmatic volunteers were exposed twice each to purified air (control) and to 4 ppm NO2 (exposure) for periods of one hour, fifteen minutes, including light and heavy bicycle exercise (fifteen minutes each). No statistically significant differences between control and exposure were found for airway resistance, symptoms, heart rate, skin conductance, or self-reported emotional state. Increased airway resistance was observable after exercise, whether in clean air or NO2. Systolic blood pressure showed small but statistically significant differences between control and exposure: it tended to be lower in NO2 than in clean air during the later part of the exposure period. In asthmatic as well as in normal subjects, earlier reports that NO2 exposure produces short-term airway constriction were unable to be confirmed. Author (GRA)

N85-16463# Saint Luke's Hospital, Milwaukee, Wis. Dept. of Hyperbaric Medicine.
SAFE DECOMPRESSION SCHEDULES FOR CAISSON WORKERS Final Report
Eric P. Kindwall, Peter O. Edel (Sea-Space Research Co., Marrero, La.), and Hewlett E. Melton (Diasonics, Inc., Milpitas, Calif.) 1 Dec. 1983 126 p refs
(Grant PHS-OH-00947)
(PB85-103612/GAR) Avail: NTIS HC A07/MF A01 CSCL 06S

A 3 year program designed to evaluate new decompression tables for compressed air workers is described. Development of tables from commercial diving data is reviewed, along with the general considerations and procedures used to compare these

and Office of Safety and Health Administration (OSHA) tables using human subjects. Specific methods are described for whole body nitrogen washout studies and ultrasonic bubble detection experiments. The authors concluded that little difference exists between the decompression schedules given by these decompression ables and OSHA tables; however, the decompression tables are significantly better than the OSHA tables since they combine the use of oxygen and stage decompression which have synergistic effects in increasing nitrogen elimination during decompression. The schedules may be difficult to implement because of added equipment costs and the need to retain caisson crews. GRA

N85-16225# Joint Publications Research Service, Arlington, Va.
VITYAZ SPECIALISTS STUDY HUMAN ADAPTABILITY TO OCEAN DEPTHS
A. Androshin *In its* USSR Rept.: Earth Sci. (JPRS-UES-84-008) 13 Dec. 1984 p 6-8 Transl. into ENGLISH from Pravda (Moscow), 27 Sep. 1984 p 6 (For primary document see N85-16223 07-42)
Avail: NTIS HC A06

N85-16431# Joint Publications Research Service, Arlington, Va.
EFFECT OF MICROWAVE RADIATION ON LOCAL BLOOD CIRCULATION AND OXYGENATION OF BRAIN TISSUE Abstract Only
N. P. Mitagvariya and Kh. I. Bicher *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 82 Transl. into ENGLISH from Byul. Eksperim. Biol. i Med. (Moscow), no. 7, Jul. 1984 p 37-39 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16432# Joint Publications Research Service, Arlington, Va.
HIGH VOLTAGE EFFECTS MEASURED ON DUMMY MANNEQUIN
S. Shpungin *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 101 Transl. into ENGLISH from Sov. Kirgiziya (USSR), 14 Sep. 1984 p 3 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16433# Joint Publications Research Service, Arlington, Va.
NATURAL ELECTRICAL ACTIVITY OF HUMAN SYMPATHETIC NERVE FIBERS, RECORDED FROM BODY SURFACE Abstract Only
V. V. Gerzanich, Yu. S. Lusaychuk, I. N. Remizov, and V. I. Skok *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 103-104 Transl. into ENGLISH from Fiz. Zh. Imeni I. M. Sechenova (Leningrad), v. 70, no. 5, May 1984 p 589-593 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16435# Joint Publications Research Service, Arlington, Va.
CENTRAL REGULATION OF SENSORY FLOW IN HUMAN VISUAL SYSTEM Abstract Only
A. M. IVanitskiy, I. A. Korsakov, and V. L. Tatko *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 107 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 339-346 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16436# Joint Publications Research Service, Arlington, Va.
LATERAL SPECIFICS OF VISUAL PERCEPTION Abstract Only
N. G. Manelis and N. V. Grebennikova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 107-108 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 347-351 Original language document was announced in IAA as A84-38502 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16437# Joint Publications Research Service, Arlington, Va.
VISUAL EVOKED POTENTIALS WITH DISRUPTED FUNCTIONING OF NONSPECIFIC CEREBRAL SYSTEMS Abstract Only
M. L. Sklovskaya and A. I. Ishmukhametov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 108 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 352-357 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16438# Joint Publications Research Service, Arlington, Va.
CHANGE IN RELATIONSHIP OF BIOPOTENTIALS OF BRAIN ZONES FOR VARIOUS LEVELS OF WORKING CAPACITY Abstract Only
Yu. A. Petrov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 109-110 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 370-374 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16439# Joint Publications Research Service, Arlington, Va.
PULMONARY BLOOD FLOW AND OXYGENATION OF ARTERIAL BLOOD IN A HEALTHY SUBJECT UPON 7 DAYS HYPOKINESIA Abstract Only
E. M. Nikolayenko, V. Ye. Katkov, S. V. Gvozdev, V. V. Chestukhin, and M. I. Volkova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 110 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 10, no. 3, May - Jun. 1984 p 421-425 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16440# Joint Publications Research Service, Arlington, Va.
SPECIFICS OF DYNAMICS OF BRAIN BIOPOTENTIALS UNDER THE INFLUENCE OF COMPLEX AUDIBLE COMMUNICATIVE SIGNALS
L. P. Novitskaya *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 111 Transl. into ENGLISH from Fiziol. Cheloveka (Moscow), v. 10, no. 3, May-Jun. 984 p 469-471 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

N85-16441# Joint Publications Research Service, Arlington, Va.
BIOCHEMICAL EVALUATION OF BODILY INFLUENCE OF HIGH AND LOW TEMPERATURES Abstract Only
A. I. Barkalaya and M. A. Verkhotin *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 111-112 Transl. into ENGLISH from Gigiyena Tr. i Prof. Zabolevaniya (Moscow), no. 3, Mar. 1984 p 31-34 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

53 BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

N85-16464# Manchester Univ. (England). Dept. of Management Sciences.
JOB AND FAMILY STRESS AS PREDICTORS OF PILOT HEALTH, JOB SATISFACTION AND PERFORMANCE Final Scientific Report, 1 May 1983 - 30 Apr. 1984
C. L. Cooper and S. J. Sloan May 1984 239 p
(Grant AF-AFOSR-0148-83)
(AD-A142176; EOARD-TR-84-18) Avail: NTIS HC A11/MF A01 CSCL 05/10

The objective of the study was to investigate the occupational and domestic sources of pilot mental ill health and performance. Using a psychosocial approach, the major trends and predictive issues were to be identified. These would not only provide extensive

information but also form the basis for further research and wider practical application. Relevant background literature was reviewed. It was concluded that while a small amount of previous research had been performed relevant to the area of present investigation, it was of only limited practical utility. Comparisons with data derived from other occupations revealed that equivalent research in pilots was clearly deficient. This was particularly true in the examination of domestic sources of stress. Extensive preliminary interviews were performed to investigate the situations, highlight key issues and to generate items that could be further psychometrically tested in the main study. GRA

N85-16465# Army Command and General Staff Coll., Fort Leavenworth, Kansas.
CAN THE AGGRESSORS CONTINUE TO BE EFFECTIVE IN THE F-5E? M.S. Thesis
D. M. Krempel 1 Jun. 1984 96 p
(AD-A146861; AD-E751146) Avail: NTIS HC A05/MF A01 CSCL 05/9

The Aggressors were established with the mission to provide realistic, enemy oriented, dissimilar air combat tactics training for United States Air Force fighter units. They accomplished this mission since 1973 with first the Northrop T-38 and now the Northrop F-5E. The F-5E is an acceptable simulator of the Soviet built MIG-21 Fishbed which was originally produced in the early 1960's. This is 1984 and the Russian air combat threat has changed into a more sophisticated fighter force. This study examined the capability of the F-5E to simulate modern Soviet air combat fighters, specifically, the MIG-23 Flogger, MIG-31 Foxhound, MIG-29 Fulcrum, and SU-27 Flanker. The investigation revealed that the F-5E is not an acceptable simulator for any of these aircraft. The upgraded F-5E with an improved radar, proved to be able to serve a part-task simulator for only the MIG-23 Flogger. GRA

N85-16466# Air Force Human Resources Lab., Brooks AFB, Tex.
PRACTICE MAKES PERFECT Interim Technical Paper. Jan. 1982 - Jul. 1983
E. L. Martin Oct. 1984 13 p
(AF Proj. 1123)
(AD-A147124; AFHRL-TP-84-32) Avail: NTIS HC A02/MF A01 CSCL 05/9

This paper is an outgrowth of research and development in the application of flight simulation to training air-to-ground combat missions. Numerous discussions with subject-matter experts led to the opinion expressed in this paper that today's pilots do not get the amount of practice at each skill level that would be required for them to achieve their full potential. Unfortunately, task flying frequency requirements are driven by logistics and finances more than training requirements. This paper offers the notion that if pilots were trained in the same way as athletes are trained, substantial improvements in mission effectiveness would result. In the end, everyone stands to lose if pilots are not given the very best training that technology has to offer. Author (GRA)

N85-16419# Joint Publications Research Service, Arlington, Va.
EFFECTS OF INDIVIDUAL MNEMONIC CHARACTERISTICS ON PROBLEM SOLVING Abstract Only
L. D. Gorbunova *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 28 Transl. into ENGLISH from Psikhologicheskiy Z. (Moscow), v. 4, no. 6, Nov. - Dec. 1983 p 106-108 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

N85-16420# Joint Publications Research Service, Arlington, Va.
MENTAL STATUS IN RELATION TO SPECIAL CONDITIONS OF ACTIVITY Abstract Only
N. D. Zavalova and V. A. Ponomarenko *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 29 Transl. into ENGLISH from Psikhologicheskiy Z. (Moscow), v. 4, no. 6, Nov. - Dec. 1983 p 92-105 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N85-16467 Department of the Air Force, Washington, D.C.
HELMET MOUNTED TELESCOPE Patent
H. L. Task and C. Bates, Jr., inventors (to Air Force) Issued 15 Nov. 1982 4 p Supersedes AD-D010221
(AD-D011355; US-Patent-4,465,347; US-Patent-Appl-SN-441814; US-Patent-Class-350-538) Avail: US Patent and Trademark Office CSCL 06/17

An improved helmet is provided including means to telescopically acquire an image of a field of view, which comprises, a telescopic optical system including an objective lens mounted to said helmet above the line of sight of the wearer, a light-conducting fiber optics bundle mounted to said helmet for receiving the image from the objective lens, and collimating lens for receiving the image from the fiber optics bundle and projecting the image onto a helmet-mounted visor in the line of sight of the wearer. A shutter, remotely controllable by the wearer, may be disposed intermediate the objective lens and display to selectively block transmission of the image. Author (GRA)

N85-16468*# United Technologies Corp., Windsor Locks, Conn.
DEVELOPMENT OF A PREPROTOTYPE TIMES WASTEWATER RECOVERY SUBSYSTEM, ADDENDUM Final Report, Feb. 1982 - Jul. 1984
Gerard F. Dehner Oct. 1984 116 p
(Contract NAS9-15471)
(NASA-CR-171823; NAS 1.26:171823; SVHSER-7236-Rev-A) Avail: NTIS HC A06/MF A01 CSCL 06K

Six tasks are described reflecting subsystem hardware and software modifications and test evaluation of a TIMES wastewater recovery subsystem. The overall results are illustrated in a figure which shows the water production rate, the specific energy corrected to 26.5 VDC, and the product water conductivity at various points in the testing. Four tasks are described reflecting studies performed to develop a preliminary design concept for a next generation TIMES. The overall results of the study are the completion of major design analyses and preliminary configuration layout drawings. R.S.F.

N85-16469*# New Hampshire Univ., Durham. Complex Systems Research Center.
PROBLEMS ASSOCIATED WITH THE UTILIZATION OF ALGAE IN BIOREGENERATIVE LIFE SUPPORT SYSTEMS
M. M. Averner, M. Karel, and R. Radmer Nov. 1984 24 p refs (Contract NCC2-210)
(NASA-CR-166615; NAS 1.26:166615) Avail: NTIS HC A02/MF A01 CSCL 06C

A workshop was conducted to identify the potential problems associated with the use of microalgae in biorregenerative life support systems, and to identify algae related research issues that must be addressed through space flight experimentation. Major questions to be resolved relate to the choice of algal species for inclusion in a bioregenerative life support system, their long term behavior in the space environment, and the nature of the techniques required for the continuous growth of algae on the scale required. Consideration was given to the problems associated with the conversion of algal biomass into edible components. Specific concerns were addressed and alternative transformation processes identified and compared. The workshop identified the following major areas to be addressed by space flight experimentation: (1) long term culture stability, (2) optimal design of algal growth reactors, and (3) post growth harvesting and processing in the space environment. B.W.

N85-16470*# Martin Marietta Labs., Baltimore, Md.
ALGAL CULTURE STUDIES RELATED TO A CLOSED ECOLOGICAL LIFE SUPPORT SYSTEM (CELSS)

R. Radmer, P. Behrens, E. Fernandez, O. Ollinger, C. Howell, A. Venables, D. Huggins, and R. Gladue Oct. 1984 49 p refs
(Contract NAS2-10969)
(NASA-CR-177322; NAS 1.26:177322) Avail: NTIS HC A03/MF A01 CSCL 06C

In many respects, algae would be the ideal plant component for a biologically based controlled life support system, since they are eminently suited to the closely coupled functions of atmosphere regeneration and food production. Scenedesmus obliquus and Spirulina platensis were grown in three continuous culture apparatuses. Culture vessels their operation and relative merits are described. Both light and nitrogen utilization efficiency are examined. Long term culture issues are detailed and a discussion of a plasmid search in Spirulina is included. B.W.

N85-16471*# Wisconsin Univ., Madison. Dept. of Horticulture.
CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM HIGHER PLANT FLIGHT EXPERIMENTS
Theodore W. Tibbitts and Raymond M. Wheeler Nov. 1984 24 p refs
(Contract NCC2-136)
(NASA-CR-177323; NAS 1.26:177323) Avail: NTIS HC A02/MF HC A02/MF A01 CSCL 06K

Requirements for spaceflight experments which involve higher plants were determined. The plants are studied for use in controlled ecological life support systems (CELSS). Two categories of research requirements are discussed: (1) the physical needs which include nutrient, water and gas exchange requirements; (2) the biological and physiological functions which affect plants in zero gravity environments. Physical problems studies are given the priority since they affect all biological experiments. E.A.K.

N85-16472*# California Univ., Berkeley. Coll. of Engineering.
CONTROL AND MODELING OF A CELSS (CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM)
David Auslander, Robert Spear, Philip Babcock, and Miriam Nadel Oct. 1983 85 p refs
(Contract NCC2-67)
(NASA-CR-177324; NAS 1.26:177324) Avail: NTIS HC A05/MF A01 CSCL 06K

Research topics that arise from the conceptualization of control for closed life support systems which are life support systems in which all or most of the mass is recycled are discussed. Modeling and control of uncertain and poorly defined systems, resource allocation in closed life support systems, and control structures or systems with delay and closure are emphasized. E.A.K.

N85-16473*# Massachusetts Inst. of Tech., Cambridge. Dept. of Nutrition and Food Science.
FEASIBILITY OF PRODUCING A RANGE OF FOOD PRODUCTS FROM A LIMITED RANGE OF UNDIFFERENITIATED MAJOR FOOD COMPONENTS
Marcus Karel and Ahmad R. Kamarei Apr. 1984 117 p refs
(Contract NCC2-231)
(NASA-CR-177329; NAS 1.26:177329) Avail: NTIS HC A06/MF A01 CSCL 06H

This report reviews current knowledge associated with producing safe, nutritious, and acceptable foods from a limited number of source independent macronutrients. The advantages, and disadvantages, of such an approach for use by space crews are discussed. The production of macronutrients from a variety of sources is covered in detail. The sources analyzed are: wheat, soybeans, algae (3 genera), glycerol, and digested cellulose. Fabrication of food from the above macronutrient sources is discussed and particular attention is addressed to nutrition, acceptability and reliability. The processes and concepts involved in food fabrication and macronutrient production are also considered for utilization in a space environment. Author

N85-16474# Massachusetts Inst. of Tech., Cambridge.
INTERACTION OF HUMAN COGNITIVE MODELS AND COMPUTER BASED MODELS IN SUPERVISORY CONTROL
T. B. Sheridan Mar. 1984 38 p
(Contract N00014-83-K-0193)
(AD-A142547) Avail: NTIS HC A03/MF A01 CSCL 05/8

This report summarizes the first year's effort of a three year research systems and how the operators of such systems apparently represent and utilize such knowledge. The first section of the report discusses the relationship of computer based supervisory control to computer based decision aiding (expert systems) by identifying component variables and functions and building up block diagrams. The second section deals quantitatively with internal models, knowledge, and calibration, both with respect to expectations of the existence of identifiable states of the world and with respect to the overlap of meanings of terms (mental) or linguistic encodings, fuzzy variables). The third section discusses mental models and their importance in three kinds of activities supervisors must do in complex systems: (1) discovering how things work; (2) determining what is wanted out of the set of alternatives states of the attributes; (3) encoding and manipulating fuzzy concepts; (4) combining evidence and confidence; (5) deciding what to do. The fourth section of the report deals with the human use of computer based models in automatic control and in decision aiding. It reports on three sets of experiments underway or completed. GRA

N85-16475# Human Resources Research Organization, Alexandria, Va.
HUMAN FACTORS AND TRAINING RESEARCH IN MILITARY ORGANIZATIONS AND SYSTEMS Final Report
A. L. Kubala Army Research Inst. for Behavioral and Social Sciences Oct. 1984 13 p
(Contract MDA903-79-C-0191; DA Proj. 2Q2-62717-A-765; DA Proj. 2Q2-62731-A-792)
(AD-A146832; HUMRRO-FR-MTRD(TX)-80-9; ARI-RN-84-124) Avail: NTIS HC A02/MF A01 CSCL 05/9

This report summarizes the resulting five research projects conducted between March 1979 and February 1980. Separate, more detailed reports describing the work in each of the five areas are being published concurrently. These reports are: 'Preliminary Development of the Commander's Unit Analysis Profile: A Leadership Tool for the Small Military Unit; The Impact of Adopting Physical Fitness Standards on Army Personnel Assignment: A Preliminary Study; Testing and Training Methods for Skill Qualification Testing; Reading Ability and Other Correlates of the SQT Written Component; Development of a Basic Training Program in Combat Vehicle Identification; and Improvement of Training Realism for Tactical Units: Opposing Force (OPFOR) Program. GRA

N85-16476# Human Resources Research Organization, Alexandria, Va.
HUMAN FACTORS CHARACTERISTICS OF THE JOINT TACTICAL FUSION TEST BED: FIELD TEST 467 RESULTS
P. T. Marston, A. L. Kubala, and E. R. Smootz Oct. 1984 45 p
(Contract MDA903-79-C-0191; DA Proj. 2Q2-63743-A-794)
(AD-A146856; HUMRRO-FR-MTRD(TX)-82-22; ARI-RN-84-125) Avail: NTIS HC A03/MF A01 CSCL 05/5

This report describes an analysis of the human factors characteristics of the Joint Tactical Fusion Test Bed-Army (JTFTB-A). Data were obtained from interviews, questionnaires, direct observation and physical measurements of the operator stations and environmental factors. An attempt was made to relate the findings to anticipated requirements for an All Source Analysis System (ASAS) for intelligence data. Operators gave high ratings to the large majority of the individual functions the system could perform. However, four functions were rated poorly because operators felt performance time was excessive and procedures were overly tedious. GRA

N85-16477# School of Aerospace Medicine, Brooks AFB, Tex.
HUMAN FACTORS SURVEY: C-5 PILOTS Final Report, Sep. 1982 - Mar. 1983
J. S. Major Sep. 1984 22 p
(AD-A147106; USAFSAM-TR-84-26) Avail: NTIS HC A02/MF A01 CSCL 05/9

The purpose of this study was to conduct a broad preliminary human-factors survey of MAC C-5 pilots. Questionnaire and interview data were collected from 34 C-5 pilots (volunteers), with anonymity guaranteed. Study results are grouped under demographic, mission, physical, physiological, psychological, psychosocial, and pathological categories. Potential human-factors problem areas within he C-5 pilot population are suggested by the sample-group findings. The chronic problem of airlift-crew fatigue is apparent. Nearly 56% of the survey pilots reported significant levels of fatigue during a typical leg of their most recent strategic airlift missions. Also, a majority of them indicated various problems (probably fatigue related) with attention--such as distractions during critical phases of flight, boredom/complacency during the cruise portion, and fixated/channelized attention. Many pilots reported life-event changes and stresses--including a variety of family/marital problems, recent separation/divorce, financial crisis, nonselection for promotion, and other career dissatisfactions. A significant portion of the pilots reported difficulties (again, possibly fatigue related) involving procedural recall, instrument cross-check, radio calls, missed checklist items, task saturation, and flying proficiency in general during the reference flight. The findings, including interrelationships, are discussed. These results appear consistent with reports being submitted by crewmembers to the HQ MAC/IGFF Accident Waiting to Happen (AWTH) near-mishap reporting program. The findings of this study are recommended for use by MAC's operational planners and managers. GRA

N85-16478# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AN ANALYSIS OF CONSTRAINTS TO COORDINATED TACTICAL CREW INTERACTION IN THE P-3C AIRCRAFT M.S. Thesis
J. E. Jones Sep. 1984 95 p
(AD-A147220; AFIT/GLM/LSM/84S-32) Avail: NTIS HC A05/MF A01 CSCL 05/10

The P-3C long range maritime patrol aircraft has evolved over the past thirty years into a very complex, multi-sensor weapons system platform. Increased effectiveness has been achieved by incorporating systems that rapidly process large amounts of data. However, crew members operate within relatively fixed, cognitive limitations. Mission tasks are divided among the crew members who must work together to monitor, assess and control these complex information processing systems. Little emphasis has been placed on enhancing team performance through better communication and coordination among the team members. This research effort provides an exploratory study of factors which impact team performance. Areas analyzed include current P-3C human factors, deficiencies that inhibit group interaction, a review of communication and group interaction literature relevant to the P-3C aircrew team environment, and an analysis of tactical crew station arrangement, and an analysis of tactical crew station arrangements in allied maritime patrol aircraft. GRA

N85-16479# Pattern Analysis and Recognition Corp., McLean, Va.
MENTAL MODELS AND COOPERATIVE PROBLEM SOLVING WITH EXPERT SYSTEMS
P. E. Lehner, F. W. Rook, and L. Adelman Sep. 1984 48 p
(Contract N00014-83-C-0537)
(AD-A147843; PAR-84-116) Avail: NTIS HC A03/MF A01 CSCL 05/8

A cognitive theory of user/expert system interaction is proposed that relates the quality of cooperative problem solving with an expert system to: (1) cognitive consistency--the degree of consistency between the rule-based system and the user's problem solving processes; and (2) mental model--the user's conceptual understanding of the basic principle of the system's problem solving processes. An experimental study is described that strongly supports the theoretical prediction. In particular, the results support the prediction that for users with an accurate mental model, increasing cognitive consistency significantly decreases user/expert system problem solving performance. Users not processing an accurate mental model reach higher performance when utilizing cognitive consistent procedures. The practical implications of this theory are briefly discussed. Originator-supplied keywords include: Human factors, and Man/machine interface. GRA

N85-16417# Joint Publications Research Service, Arlington, Va.
ESTABLISHMENT OF POSTURE AND WORKING MOVEMENTS OF PILOT IN AIR CRASH ENQUIRIES Abstract Only
A. V. Klyuyev and V. N. Artemov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 1 Transl. into ENGLISH from Sudebno-Med. Ekspertiza (Moscow), no. 3, Jul. - Sep. 1984 p 11-12 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

N85-16418# Joint Publications Research Service, Arlington, Va.
SPEECH-ACTION INTERRELATIONSHIPS IN OPERATIONAL WORK Abstract Only
N. V. Krylova and A. K. Bokovikov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-015) 19 Jul. 1984 p 28 Transl. into ENGLISH from Psikhologicheskiy Z. (Moscow), v. 4, no. 6, Nov. - Dec. 1983 p 48-53 (For primary document see N85-16416 07-51)
Avail: NTIS HC A06

N85-16429# Joint Publications Research Service, Arlington, Va.
MODELING OF HUMAN MOTION BY COMPUTER CONSIDERING MEASUREMENT ERRORS IN INITIAL DATA Abstract Only
A. V. Zinkovskiy and V. A. Chistyakov *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 37 Transl. into ENGLISH from Biofiz. (Moscow), v. 29, no. 4, Jul. - Aug. 1984 p 694-695 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

55 PLANETARY BIOLOGY

Includes exobiology; and extraterrestrial life.

No abstracts in this category.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

N85-16480*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
[RESEARCH IN APPLIED MATHEMATICS, NUMERICAL ANALYSIS, AND COMPUTER SCIENCE] Final Semiannual Report, 1 Apr. - 30 Sep. 1984
Dec. 1984 59 p
(Contracts NAS1-17070; NAS1-17130)
(NASA-CR-172505; NAS 1.26:172505) Avail: NTIS HC A04/MF A01 CSCL 12A

Research conducted at the Institute for Computer Applications in Science and Engineering (ICASE) in applied mathematics, numerical analysis, and computer science is summarized and abstracts of published reports are presented. The major categories of the ICASE research program are: (1) numerical methods, with particular emphasis on the development and analysis of basic numerical algorithms; (2) control and parameter identification; (3) computational problems in engineering and the physical sciences, particularly fluid dynamics, acoustics, and structural analysis; and (4) computer systems and software, especially vector and parallel computers. M.G.

60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering.*

N85-16481# Naval Postgraduate School, Monterey, Calif.
FUTURE DATABASE MACHINE ARCHITECTURES
D. K. Hsiao Sep. 1984 14 p
(AD-A146786; NPS52-84-014) Avail: NTIS HC A02/MF A01 CSCL 09/2

There are many software database management systems available on many general-purpose computers ranging from micros to super-mainframes. Database machines as backend computers can offload the database management work from the mainframe so that we can retain the same mainframe longer. However, the database backend must also demonstrate lower cost, higher performance, and newer functionality. Some of the fundamental architecture issues in the design of high-performance and great-capacity database machines are addressed. Solutions towards resolving these design issues are articulated. This article is written for the New York University's Symposium in New Directions of Database Systems on the basis of a lecture given at Microelectronic and Computer Technology, Inc. (MCC). GRA

N85-16482# Office of Naval Research, London (England).
COMPUTER SCIENCE RESEARCH IN EUROPE
J. F. Blackburn 29 Aug. 1984 14 p
(AD-A146905; ONRL-R-10-84) Avail: NTIS HC A02/MF A01 CSCL 09/2

Computer architecture, programming, and robotics represent the major new directions in European computer-science research. In computer architecture the emphasis is on large-scale computing. Functional and logic programming are receiving much attention. Sensing and control are feature in the robotics research. GRA

N85-16483# Softech, Inc., Fairborn, Ohio.
Ada COMPILER VALIDATION SUMMARY REPORT: NEW YORK UNIVERSITY (NYU Ada/ED) COMPILER, VERSION 1.4 FOR VAX 11/780, USING VMS 3.5 Final Report, 25 Jun. - 2 Jul. 1984
10 Aug. 1984 64 p
(Contract F33600-84-D-0280)
(AD-A146924) Avail: NTIS HC A04/MF A01 CSCL 09/2

The purpose of this report is to document the results of testing performed on the Ada translator and, in particular, to (1) identify any language constructs supported by the translator that do not conform to the Ada standard; (2) identify any unsupported language constructs required by the Ada standard; and (3) describe implementation-dependent behavior allowed by the standard. GRA

N85-16484# Softech, Inc., Fairborn, Ohio.
Ada COMPILER VALIDATION SUMMARY REPORT: TELESOFT (TELESOFT Ada) COMPILER, VERSION 2.0a FOR SUN 120 MOTOROLA M68010, USING 4.2 BSD UNIX-SUN VERSION 1.1 Final Report, 18 - 27 Jun. 1984
10 Aug. 1984 64 p
(Contract F33600-84-D-0280)
(AD-A146925) Avail: NTIS HC A04/MF A01 CSCL 09/2

The purpose of this report is to document the results of testing performed on the Ada translator and, in particular, to (1) identify any language constructs supported by the translator that do not adhere to the Ada standard; (2) identify any unsupported language constructs required by the Ada standard; and (3) discuss implementation-dependent behavior allowed by the standard. GRA

N85-16485# Air Force Flight Test Center, Edwards AFB, Calif.
INTERACTIVE SIGNAL ANALYSIS SOFTWARE (ISAS). USER'S MANUAL Final Report
R. M. Davino Jul. 1984 140 p
(AD-A146999; AFFTC-TIM-84-4) Avail: NTIS HC A07/MF A01 CSCL 09/2

The interactive dynamic signal analysis software consists of a set of generalized interactive programs which are user friendly and capable of the enhancement, analysis, and display of digital time history data. This software is hosted on the Control Data Cyber 740 Computer System. The analysis software is generalized to allow application to many unique and specific project analysis requirements. Time history data can be edited, modified according to appropriate calibration requirements, and consolidated for convenient handling of parameters. Time history data can also be enhanced through several digital filtering techniques. Data analysis is performed in the time domain and in the frequency domain through Fourier transform based spectral analysis techniques. This provides analysis capabilities such as the determination of the fast Fourier transform and the power spectral density of a parameter as well as the transfer function between several parameters. Analysis results are presented in tabular and graphic form through a line printer or terminal display. These generalized analysis techniques are exemplified through an application to gas turbine engine dynamics. Author (GRA)

N85-16486# Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Computer Science.
SUPPORT FOR DISTRIBUTED TRANSACTIONS IN THE TABS (TRANSACTION BASED SYSTEMS) PROTOTYPE
A. Z. Spector, J. Butcher, D. S. Daniels, D. J. Duchamp, and J. L. Eppinger Jul. 1984 29 p
(Contracts N00014-79-C-0661; F33615-81-K-1539)
(AD-A147213; CMU-CS-84-132) Avail: NTIS HC A03/MF A01 CSCL 09/2

The TABS (Transaction Based Systems) Prototype is an experimental facility at Carnegie-Mellon University that provides operating system-level support for distributed transactions that operate on shared abstract types. It is hoped that the facility will simplify the construction of highly available and reliable distributed applications. The paper describes the TABS system model, the TABS prototype's structure, and certain aspects of its operation. The paper concludes with a discussion of the status of the project and a preliminary evaluation. GRA

N85-16487# Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering.
DECENTRALIZED CONTROL OF SCHEDULING IN DISTRIBUTED SYSTEMS Quarterly Report, 15 Jun. - 14 Sep. 1984
J. A. Stankovic 14 Sep. 1984 14 p
(AD-A147446) Avail: NTIS HC A02/MF A01 CSCL 09/2

This report summarizes the work performed during the period of June 15, 1984 to September 14, 1984. The work concentrated on the stability question of decentralized algorithms, further development of our test-bed simulation program and completion of a Master's thesis. Most new results obtained in this quarter are still preliminary and we expect more complete conclusions by the end of the next quarter. Author (GRA)

N85-16488# General Electric Co., Schenectady, N. Y. Corporate Research and Development Dept.
MICROCOMPUTER CONTROL OF A RESIDENTIAL PHOTOVOLTAIC POWER CONDITIONING SYSTEM
B. K. Bose, R. L. Steigerwald, and P. M. Szczesny 1984 25 p refs Presented at IEEE-IAS Meeting, Chicago, 30 Sep. 1984
(Contract DE-AC04-76DP-00789)
(DE84-014774; CONF-8409108-1) Avail: NTIS HC A02/MF A01

Microcomputer-based control of a residential photovoltaic power conditioning system is described. The microcomputer is responsible for array current feedback control, maximum power tracking control, array safe zone steering control, phase-locked reference wave synthesis, sequencing control, and some diagnostics. The control functions are implemented using Intel 8751 single-chip microcomputer-based hardware and software. The controller was tested in the laboratory with the prototype power conditioner and shows excellent performance. DOE

N85-16428# Joint Publications Research Service, Arlington, Va.
EYES FOR COMPUTERS Abstract Only
L. Pilman *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-027) 27 Dec. 1984 p 36 Transl. into ENGLISH from Kom. Tadzhik. (USSR), 5 Sep. 1984 p 3 (For primary document see N85-16426 07-51)
Avail: NTIS HC A08

61 COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms.

N85-16489*# Odyssey Research Associates, Inc., Ithaca, N.Y.
FORMAL VERIFICATION OF MATHEMATICAL SOFTWARE Final Report
David Sutherland May 1984 155 p refs
(Contract NAS1-17579)
(NASA-CR-172407; NAS 1.26:172407) Avail: NTIS HC A08/MF A01 CSCL 09B

Methods are investigated for formally specifying and verifying the correctness of mathematical software (software which uses floating point numbers and arithmetic). Previous work in the field was reviewed. A new model of floating point arithmetic called the asymptotic paradigm was developed and formalized. Two different conceptual approaches to program verification, the classical Verification Condition approach and the more recently developed Programming Logic approach, were adapted to use the asymptotic paradigm. These approaches were then used to verify several programs; the programs chosen were simplified versions of actual mathematical software. B.W.

N85-16490*# Informatics General Corp., Palo Alto, Calif.
RATFOR USER'S GUIDE VERSION 2.0
Leland C. Helmle Jan. 1985 51 p refs
(Contract NAS2-11555)
(NASA-CR-166601; NAS 1.26:166601) Avail: NTIS HC A04/MF A01 CSCL 09B

This document is a user's guide for RATFOR at Ames Research Center. The main part of the document is a general description of RATFOR, and the appendix is devoted to a machine specific implementation for the Cray X-MP. The general stylistic features of RATFOR are discussed, including the block structure, keywords, source code, format, and the notion of tokens. There is a section on the basic control structures (IF-ELSE, ELSE IF, WHILE, FOR, DO, REPEAT-UNTIL, BREAK, NEXT), and there is a section on the statements that extend FORTRAN's capabilities (DEFINE, MACRO, INCLUDE, STRING). THE appendix discusses everything needed to compile and run a basic job, the preprocessor options, the supported character sets, the generated listings, fatal errors, and program limitations and the differences from standard FORTRAN. B.W.

N85-16491*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
JPL ROBOTICS LABORATORY COMPUTER VISION SOFTWARE LIBRARY
Robert Cunningham 1 Nov. 1984 49 p refs
(Contract NAS7-918)
(NASA-CR-174272; JPL-Publ-84-66; NAS 1.26:174272) Avail: NTIS HC A03/MF A01 CSCL 09B

The past ten years of research on computer vision have matured into a powerful real time system comprised of standardized commercial hardware, computers, and pipeline processing laboratory prototypes, supported by an extensive set of image processing algorithms. The software system was constructed to be transportable via the choice of a popular high level language (PASCAL) and a widely used computer (VAX-11/750), it comprises a whole realm of low level and high level processing software that has proven to be versatile for applications ranging from factory automation to space satellite tracking and grappling. Author

N85-16492# California Univ., Berkeley. Dept. of Civil Engineering.
AN ALGORITHM FOR ASSEMBLY OF STIFFNESS MATRICES INTO A COMPACTED DATA STRUCTURE Final Report, May 1980 - Dec. 1983
B. Nour-Omid and R. L. Taylor Port Hueneme, Calif. NCEL Sep. 1984 21 p
(Contracts N00014-76-C-0013; N62583-83-M-T265; DA Proj. YR0-2303)
(AD-A146727; NCEL-CR-84.032) Avail: NTIS HC A02/MF A01 CSCL 09/2

A data structure is described that stores only the non-zero terms of the assembled stiffness matrix. This storage scheme results in considerable reduction in memory demand during the assembly phase of a finite element program. Therefore, larger matrices can be formed in the main memory of the computer. When secondary store must be used this approach reduces the I/O cost during the assembly stage. An algorithm is derived that starts with the element connectivity information and generates the compacted data structure. The elements matrices are then assembled to form the stiffness matrix with this storage scheme. The assembly algorithm is described and a FORTRAN listing of the routines are presented. The reduction in storage is demonstrated with the aid of numerical examples. GRA

N85-16493# Army Engineer Waterways Experiment Station, Vicksburg, Miss.
COMPUTER PROGRAM FOR DETERMINING INDUCED STRESSES AND CONSOLIDATION SETTLEMENTS (CSETT) Final Report
A. E. Templeton Aug. 1984 185 p
(AD-A146730; WES-Instruction-K-84-7) Avail: NTIS HC A09/MF A01 CSCL 08/13

This report documents CSETT, a computer program designed to compute consolidation settlement of compressible soils resulting from simple and complex loading conditions. The program provides ultimate settlement and time-rate of consolidation for the total soil mass specified and for the individual compressible soil layers within the soil mass. Additionally, it provides the in situ overburden pressures and the induced stresses. Induced stresses are determined by integration of either Boussinesq or Westergaard point load equations over general shaped loaded regions. Loaded regions may consist of simple or complex geometric shapes for singular or multiple loads entered as two-dimensional pressure profiles, two-dimensional soil embankment profiles, or three-dimensional polygons. Settlement computations are based on strain versus effective stress or void ration versus effective stress relationships. The rate of consolidation is determined using Terzaghi's one-dimensional consolidation theory. The program provides for analysis of multiple soil layers and a variety of drainage conditions. Data can be input interactively or by entering a predefined data file. Data files are created using command words that identify corresponding data items. GRA

N85-16494# Massachusetts Computer Associates, Inc., Wakefield.
NSW (NATIONAL SOFTWARE WORKS) LESSONS LEARNED Final Report, Oct. 1982 - Dec. 1983
C. Muntz, M. Marcus, K. Sattley, and B. Shipman Griffiss AFB, N.Y. RADC May 1984 112 p
(Contract F30602-83-C-0040)
(AD-A146737; CADD-8312-3001; RADC-TR-84-90) Avail: NTIS HC A06/MF A01 CSCL 09/2

The goals of the National Software Works Project were to demonstrate the feasibility and practicality of providing users uniform access to services on a diverse set of computers and operating systems. We have, indeed, succeeded in showing that such access is possible by building, running, and maintaining a system called NSW, which ran on the Arpanet in one form or another between 1976 and 1983. In its final version, NSW connected an IBM 370, two TOPS-20s, a MULTICS and several UNIXes. The need to interact with different computer systems is ever increasing in both military and commercial sectors. The lessons learned from the construction of NSW can help those

building the next generation of these systems. This report is about those lessons we learned. GRA

N85-16495# New York Univ., New York. Inst. of Mathematical Sciences.
NYU Ada/Ed USER'S GUIDE: VERSION 1.4 FOR VAX/VMS SYSTEMS
1 Jul. 1984 35 p
(Contract DAAB07-82-K-J196)
(AD-A146759; DOD/DF-85/002A) Avail: NTIS HC A03/MF A01 CSCL 09/2

This is the User's Guide for the Ada/Ed Translator, version 1.41, which was validated by the Ada Validation Facility during July 1984. Ada/Ed is the first Ada translator to be validated under version 1.4 of the ACV test suite. The design goal of the NYUADA project has been to produce a complete language Ada system which is faithful in all respects to the language definition, and that can serve as an operational definition of Ada, to be perused by language designers, implementors and users. The design and implementation of Ada/Ed was initiated at a point when the language was not completely defined or understood (in fact the first version was an implementation of Preliminary Ada), and has culminated in the first fully validated ANSI-Ada translator. GRA

N85-16496# Softech, Inc., Waltham, Mass.
Ada TRAINING CURRICULUM. REAL-TIME SYSTEMS IN Ada L401 TEACHER'S GUIDE, VOLUME 1
Jul. 1984 390 p
(Contract DAAB07-83-C-K514)
(AD-A146782) Avail: NTIS HC A17/MF A01 CSCL 09/2

Real-time systems in ADA course outline contains: Concurrent Programming Concepts, ADA Tasking Concepts, Task Cooperation, Fundamental Task Designs, Other Tasking Features, Improving Performance, and Module Wrap-Up. GRA

N85-16497# Softech, Inc., Waltham, Mass.
Ada TRAINING CURRICULUM. REAL-TIME SYSTEMS IN Ada L401 TEACHER'S GUIDE, VOLUME 2
Jul. 1984 548 p
(Contract DAAB07-83-C-K514)
(AD-A146783) Avail: NTIS HC A23/MF A01 CSCL 09/2

Ada is a viable language for real-time programming. Standard problems such as cyclic executives can be solved in Ada. The runtime system can be adapted to support a particular environment. If a real-time problem can be solved effectively, it can be solved effectively in Ada. Fundamental task designs contain: Server and user tasks, Monitors, Message buffers, Cyclic processing, and Stream-oriented task design. GRA

N85-16498# Boeing Aerospace Co., Seattle, Wash. Engineering Technology Div.
SOFTWARE TEST HANDBOOK Final Report, Mar. 1982 - Sep. 1983
E. Presson Griffiss AFB, N.Y. RADC Mar. 1984 58 p
(Contract F30602-82-C-0059)
(AD-A146844; RADC-TR-84-53-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 09/2

The purpose of the Software Test Handbook effort was to provide Air Force software developers with guidelines and methodology for the effective use of higher order language (HOL) software testing techniques and in the selection of automated tools for the testing of computer programs. The effort resulted in a two volume final technical report. The total contractual effort including a project overview, summary for each of three technical tasks, and a bibliography. GRA

N85-16499# Computer Corp. of America, Cambridge, Mass.
PROGRAM VISUALIZATION: GRAPHICS SUPPORT FOR SOFTWARE DEVELOPMENT Final Report
C. F. Herot, G. P. Brown, R. T. Carling, and D. A. Kramlich 28 Sep. 1984 44 p
(Contract N00014-81-C-0456)
(AD-A146887) Avail: NTIS HC A03/MF A01 CSCL 09/2

This document is the final report on the design and implementation of a program visualization (PV) environment, intended to offer the user an integrated graphics programming support system. The PV environment has capitalized on recent progress in the graphical representation of information, to provide designers and programmers with both static and dynamic (animated) views of systems. The PV research prototype supports programming in C, although large portions of the system are independent of the software development language. The goal of program visualization is to facilitate the understanding of programs by people. To visualize means to see or form a mental image of. Successful program visualizations aid programmers in the formation of clear and correct mental images of the structure and function of programs. GRA

N85-16500# Maryland Univ., College Park. Dept. of Computer Science.
FUNCTIONAL SEMANTICS OF MODULES
J. Gannon, D. Hamlet (Oregon Graduate Center for Study and Research, Beaverton), and H. Mills Beaverton, Oreg. Oregon Graduate Center for Study and Research Sep. 1984 19 p
(Contract F49620-80-C-0004)
(AD-A146923; CS/E-84-005; AFOSR-84-0879TR) Avail: NTIS HC A02/MF A01 CSCL 09/2

Because large-scale software development is a struggle against internal program complexity, the modules into which programs are divided play a central role in software engineering. A module encapsulating a data type allows the programmer to ignore both the details of its operations, and of its value representations. It is a primary strength of program proving that as modules divide a program, making it easier to understand so do they divide its proof. Each module can be verified in isolation, then its internal details ignored in a proof of its use. This paper describes proofs of module abstractions based on the functional method of Mills, and contrasts this with the Alphard formalism based on Hoare logic. Author (GRA)

N85-16501# Florida State Univ., Gainesville. Dept. of Industrial and Systems Engineering.
A PROGRAM TO PRODUCE STANDARD SHEWHART CONTROL CHARTS FOR THE STATISTICS X-BAR AND R OR S, P, NP, C, OR U
J. E. King and R. S. Leavenworth Sep. 1984 35 p
(Contract N00014-83-K-0093)
(AD-A146971; RR-84-31) Avail: NTIS HC A03/MF A01 CSCL 09/2

This report presents an interactive FORTRAN 77 computer program for developing and plotting standard Shewhart control charts for X-bar and R or s, p, np, c or u. It was developed on a VAX 11/750 computer using the VMS operating system. Central lines and control limits may be based on the input data, modifications of input data, or standard values. Input data is stored in separate named files so that it may be recalled, modified, or added to. GRA

N85-16502# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
THE EFFECTS OF SOFTWARE QUALITY CONTROL AND BASELINE MANAGEMENT ON THE ACQUISITION OF COMPUTER PROGRAMS M.S. Thesis
S. C. Kimhan, III and D. M. King Sep. 1984 144 p
(AD-A147051; AFIT/GLM/LSM/84S-35) Avail: NTIS HC A07/MF A01 CSCL 05/1

This thesis examines the issue of software development for Embedded Computer Systems, within the context of the Software Development Life Cycle (SDLC), from the perspective of Software Quality Assurance (SQA) and Baseline Management. The objective of this research effort is to develop an approach for the joint application of SQA and Baseline Management to improve management control (maintain cost and schedule integrity) during the software development process. Initially, the disciplines of SQA and Baseline Management are presented as individual components, operating during the SDLC, which provide management with increased control over the software development process. General

concepts associated with SQA are first discussed, including the potential role of Software Metrics. This is followed by a review of Department of Defense literature pertaining to SQA and Baseline Management, which are then studied as a combined approach towards the effective management control of the software development process. GRA

N85-16503# Bolt, Beranek, and Newman, Inc., Canoga Park, Calif.
NOISEMAP 4.4 COMPUTER PROGRAM UPDATE, OPERATOR'S MANUAL, ADDENDUM 1 Final Report
R. D. Horonjeff Wright-Patterson AFB, Ohio AMRL Sep. 1984 16 p
(Contract F33615-82-C-0501)
(AD-A147091; BBN-5657; AFAMRL-TR-78-109-ADD-1) Avail: NTIS HC A02/MF A01 CSCL 09/2

This report, an addendum to a previous document, describes new capabilities for the NOISEMAP program that allow calculation of the daily noise exposure at 20 user-specified locations. The program also produces a detailed listing of the aircraft flight and ground operations which are the greatest contributors to the daily noise exposure at each specified location. NOISEMAP is a general purpose digital computer program which creates noise exposure maps for land areas surrounding civil and military air installations. The programs have been written in FORTRAN IV and optimized for execution on Control Data Corporation (CDC) 6000, 7000, and Cyber 170 series computers. GRA

N85-16504# Maryland Univ., College Park. Dept. of Computer Science.
DEBUG TESTING AND CONFIDENCE TESTING
D. Hamlet Aug. 1984 17 p
(Contract F49620-80-C-0004)
(AD-A147104; CS/E-84-004; AFOSR-84-0867TR) Avail: NTIS HC A02/MF A01 CSCL 09/2

The strong point of computer program testing has always been failure. When a test fails, it is clear what to do, and this has led to the maximum that the goal of testing is finding faults. Testing theory, on the other hand, has tried to connect test success to program correctness. Call the kind of testing that seeks failures debug testing, and the other confidence testing. A confidence-testing technique might in principle be used for debugging, but debugging tools cannot establish confidence. Debug testing is an activity intertwined with the whole of program development, and its theory must take account of this sociological context; debugging is a human craft. On the other hand, confidence testing theory may take program and test as given, without their human origins. Only by separating the two kinds of testing can reasonable goals be set for testing theory. The difference between debug- and confidence-testing theory is illustrated by detailed analysis of partition testing, and of experiments to validate debugging test tools. Goals for each kind of theory are proposed. Originator-supplied keywords include: nose-rubbing effect, and probabilistic correctness. GRA

N85-16505# Softech, Inc., Fairborn, Ohio.
Ada COMPILER VALIDATION SUMMARY REPORT: TELESOFT (TELESOFT Ada) COMPILER, VERSION 2.0A2 FOR CALLAN UNISTAR 300, USING SYSTEM V, VERSION 4.1A Final Report, 24 - 26 Jun. 1984
10 Aug. 1984 66 p
(Contract F33600-84-D-0280)
(AD-A147115; Rept-3285-2-15.2) Avail: NTIS HC A04/MF A01 CSCL 09/2

This report describes the results of the validation effort for the TeleSoft (TeleSoft Ada) Compiler version 2.0a2, for the Callan Unistar 300, using System V Version 4.1a, tested with version 1.3 of the Ada Compiler Validation capability. Author (GRA)

N85-16506# Georgia Inst. of Tech., Atlanta. School of Mathematics.
MONOTONE OPERATORS IN MATHEMATICAL PROGRAMMING Final Report, 15 Jun. 1983 - 14 Jun. 1984
J. E. Spingarn Aug. 1984 22 p
(Grant AF-AFOSR-0195-80)
(AD-A147309; AFOSR-84-0902TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

An algorithm was investigated for solving problems where the object is to find x epsilon A and y epsilon A with y epsilon T(x), where T is a maximal monotone multifunction. An algorithm was described for finding a feasible point for a system of linear inequalities. For inconsistent systems, the feasible point algorithm was shown to generate a sequence converging at a linear rate to the set of least-square solutions. A primal-dual decomposition method was investigated to solve the separable convex programming problem. Author (GRA)

N85-16507# Ballistic Research Labs., Aberdeen Proving Ground, Md.
A VIRIAL EQUATION OF STATE OPTION FOR THE TIGER COMPUTER PROGRAM
A. K. R. Celmins Oct. 1984 69 p
(DA Proj. 1L1-61102-AH-43)
(AD-A147490; AD-F300504; BRL-TR-2597) Avail: NTIS HC A04/MF A01 CSCL 09/2

This report describes a truncated virial equation of state option for the TIGER computer program which computes the thermodynamic properties of systems of gases, liquids and solids. The second virial coefficients of the aDDED EQUATION IS BASED ON Lennard-Jones (6-12) intermolecular potential, whereas the third virial coefficient is derived from a simplified rigid sphere approximation. This report provides an outline of the derivation of the pertinent formulas and a listing of the added subroutines. The listing contains numerous comments that may be useful for a preparation of other gaseous state equations for the TIGER program. GRA

N85-16508# Ballistic Research Labs., Aberdeen Proving Ground, Md.
THE ELECTRONIC TYPESETTING PROGRAM PROGRAMMER'S MANUAL Final Report
J. H. Whiteside and C. G. Messina (NBS, Washington, D.C.) Aug. 1984 130 p
(AD-A147500; AD-F300488; ARBRL-MR-03379) Avail: NTIS HC A07/MF A01 CSCL 14/5

A new method of processing the data to make print masters (images from which printing plates are made) for artillery firing tables has been developed. The new system uses electronic typesetting, derived from the National Bureau of Standards Typographic System, to prepare data for a photocomposition machine. This is a programmer's manual with information on how the program works, how to alter it to produce artillery firing tables, and the structure of the Typographic System from which it is derived. GRA

N85-16509# Naval Civil Engineering Lab., Port Hueneme, Calif.
INTERACTIVE COLOR-GRAPHICS INTERFACE FOR ENERGY MONITORING AND CONTROL SYSTEMS Final Report, Oct. 1979 - Sep. 1983
K. J. Canfield May 1984 21 p
(AD-A147538; NCEL-TN-1699) Avail: NTIS HC A02/MF A01 CSCL 13/1

An EMCS(Energy Monitoring and Control System) can be described as a system that automatically takes care of routine operation of equipment and provides centralized reporting and override capabilities. Equipment controlled by an EMCS would be heating, ventilating, and air conditioning (HVAC) equipment, air compressors, and small package boiler units. The EMCS would obtain raw information (data) from sensors associated with the equipment and massage the data into useful information. The information obtained from the sensors plus additional information available to the EMCS would be used to control the equipment. The information would also be available to the operator in the form of reports or in response to operator commands for specific information. EMCS are computerized systems that control and monitor energy consuming and producing equipment at Naval facilities. The larger systems have been installed with color-graphics

cathode ray tube operator consoles to provide better information to the personnel operating these systems. This report summarizes the work done on defining an adequate operator console and recommends changes to the existing EMCS Guide Specifications. Originator-supplied keywords include: energy management and man-machine interface. GRA

N85-16510# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A SURVEY AND EVALUATION OF SOFTWARE QUALITY ASSURANCE M.S. Thesis
S. P. Lamb Sep. 1984 127 p
(AD-A147552; AFIT/GSM/LSY/84S-19) Avail: NTIS HC A07/MF A01 CSCL 09/2

It is crucial to the success of mission critical computer resources (MCCR) that software be delivered for operational use with the minimum number of errors possible. For this reason, the discipline of software quality assurance is needed. This thesis focuses on data collection by means of an extensive literature review and personal interviews with civilian and Air Force software development organizations. Then analysis was performed to determine what approaches would improve the quality of software before delivery to the Air Force for operational use. To provide the highest level of software quality, the entire development process must include quality checks at each step from design through acceptance test. An active software quality assurance program that identifies and corrects errors during the development process is necessary. This effort will lead to significant defects being identified and resolved early. If the quality of software is to improve, greater emphasis must be placed on software quality assurance as a separate discipline. Software conformance standards must be provided. Technology is constantly changing and advancing, and provision must be made to update personnel in the state-of-the-art quality assurance practices. GRA

N85-16511# General Electric Co., Arlington, Va. Data and Information Systems.
ON THE STRUCTURE OF INFORMATION IN SOFTWARE Final Report, 15 Jul. 1983 - 30 Sep. 1984
D. A. Boehm-Davis Oct. 1984 15 p
(Contract N00014-83-C-0574; RR0-4209)
(AD-A147580; GEC/DIS/TR-84-B1V-2) Avail: NTIS HC A02/MF A01 CSCL 09/2

This report summarizes research designed to evaluate program design methodologies, which claim to enhance the program design process. In this research project, professional programmers were asked to produce pseudo-code solutions to three problems. The time it took them to generate the solution, the completeness of the design solution, and the complexity of the solution were all measured. These data were used to develop profiles for the solutions produced by the different methodologies and to develop comparisons between methodologies. The data suggest that the well-defined methodologies (i.e., Jackson and object-oriented) do provide advantages over the less well-defined methodology of functional decomposition. Originator-supplied keywords include: Software engineering, Software experiments, Modern programming practices, Program design methodologies, and Software human factors. GRA

N85-16512# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
IMPLEMENTATION OF A CONSTRAINT MACHINE FOR PRISM - A PARALLEL PROBLEM SOLVER M.S. Thesis
W. P. Bradley 1984 154 p
(AD-A147844; AFIT/CI/NR-84-81T) Avail: NTIS HC A08/MF A01 CSCL 09/2

This thesis describes the implementation of a constraint machine for a parallel inference system, PRISM. PRISM is a logic programming system designed to run on a new parallel computer called ZMOB. PRISM consists of three different kinds of machine, problem solving, intensional database and extensional database machines. Each will run on separate processors on the ZMOB, and there will be many of each type, all cooperating to solve a problem. The constraint machine is a fourth class of machine for PRISM. It will use a database of integrity constraints, supplied by the user, to help the problem solvers. It will do so by pruning branches from the problem solvers goal tree whenever a goal node violates an integrity constraint. This will prevent the problem solver from exploring some paths that will ultimately fail. The constraint machine uses a subsumption algorithm to determine if a goal node violates an integrity constraint. It is hoped that the constraint machine will improve the performance of the PRISM system. GRA

N85-16513# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
WHAT A PARALLEL PROGRAMMING LANGUAGE HAS TO LET YOU SAY
Alan Bawden and Philip E. Agre Sep. 1984 28 p
(Contract N00014-80-C-0505)
(AD-A147854; AI-M-796) Avail: NTIS HC A03/MF A01 CSCL 09/2

We have implemented in simulation a prototype language for the Connection Machine called CLI. CLI is an extrapolation of serial machine programming language technology: in CLI one programs the individual processors to perform local computations and talk to the communications network. We present details of the largest of our experiments with CLI, an interpreter for Scheme (a dialect of Lisp) that allows a large number of different Scheme programs to be run in parallel on the otherwise SIMD Connection Machine. Our aim was not to propose Scheme as a language for Connection Machine programming, but to gain experience using CLI to implement an interesting and familiar algorithm. Consideration of the difficulties we encountered led us to the conclusion that CLI programs do not capture enough of the casual structure of the processes they describe. Starting from this observation, we have designed a successor language called CGL (Connection Graph Language). GRA

N85-16514# Naval Research Lab., Washington, D. C. Fluid Dynamics Branch.
PLOT3D: AN INTERACTIVE GRAPHICS CODE FOR 3-DIMENSIONAL PLOTS Final Report
G. A. Keramidas, E. W. Miner, and W. Bauman 28 Sep. 1984 51 p
(AD-A147887; NRL-MR-5410) Avail: NTIS HC A04/MF A01 CSCL 09/2

The PLOT3D graphics computer code provides a user with an interactive and powerful tool for quickly analyzing three dimensional functional data. The code allows the user to choose from a variety of options or parameters in selecting an appropriate display of data. The flexibility of the code should be sufficient to satisfy a wide range of user needs. The code runs in an interactive mode so that the user can easily obtain the desired display of data. All options and parameters (such as hidden line removal) are selected from one of the two menus in the program. This report describes the basic operation procedure, structure and use of the PLOT3D computer graphics code. A description of the code is given in the first part of this manual followed by the description of the input parameters and the requirements for using the code. Some samples of the capabilities of the code are given at the end of this report. GRA

N85-16515# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
SOME SCIENTIFIC SUBROUTINES IN LISP
G. Roylance 27 Sep. 1984 12 p
(Contracts N00014-80-C-0505; N00014-80-C-0622)
(AD-A147889; AI-M-774) Avail: NTIS HC A02/MF A01 CSCL 09/2

A LISP library of mathematical functions which calculates hyperbolic and inverse hyperbolic functions, Bessel functions, elliptic integrals, the gamma and beta functions, and the incomplete gamma abd beta functions is described. There are probability density functions, cumulative distributions, and random number generators for the normal, Poisson, chi-square, Student's T and Snedecor's F functions. Multiple linear regression, Fletcher-Powell

unconstrained minimization, numerical integration, root finding, and convergence are included, as well as code to factor numbers and to do the Solovay-Strassen probabilistic prime test. Author (GRA)

N85-16516# Rijksuniversitair Centrum te Antwerpen (Belgium).
OPERATING SYSTEM VERSUS PROGRAMMING ENVIRONMENT, FOR EXAMPLE THE UNIX [OPERATING SYSTEM VS PROGRAMMEROMGEVING MET UNIX ALS VOORBEELD]
J. C. Looijen May 1984 39 p refs In DUTCH
(SWA-84/037; B8471174) Avail: NTIS HC A03/MF A01

Concepts such as operating system, programming environment, software portability, and computer architecture are clarified in order to give a better insight into their significance and mutual connection. The UNIX operating system is discussed. An active program functions as a virtual machine which can interpret and execute tasks written in its machine language. A hierarchy of virtual machines exists in a computer system. An operating system is also a virtual machine. The user of a computer system experiences a virtual machine consisting of a collection of machines such as editors, linkers, compilers, debuggers, file-maintenance utilities, etc. This collection together with the command-language-machine forms the so-called programming environment. A very portable programming language is obtained by using higher programming languages. Author (ESA)

N85-16517# National Bureau of Standards, Washington, D.C.
DOCUMENT INTERCHANGE FORMAT
Joan E. Knoerdel and Shirley Ward Satkins Apr. 1984 41 p Sponsored in part by Navy
(PB84-217033; NBSIR-84/2836) Avail: NTIS HC A03/MF A01 CSCL 09B

In the absence of standards, both the private and public sectors have addressed document interchange among different vendors' text processing stems in a number of ways. In an attempt to solve this interchange problem with respect to encoding of control functions for the Department of the Navy, a project was originated by the Office of the Under Secretary of the Navy for Financial Management to determine the formation requirements of the Department of the Navy and to translate those requirements to a represeniation that would be supported by text processing system providers. The encoded representation of the formatting control functions is known as the Document Interchange Format (DIF). The overall approach taken by the DIF and definitions and implementation details for DIF are described. GRA

N85-16518# Computer Corp. of America, Cambridge, Mass.
MODEL-MODEL MAPPINGS AND CONVERSION IN A FAMILY OF DATA MODEL SPECIFICATIONS Final Report
Frank A. Manola 10 Mar. 1984 50 p refs
(Contract NB79-SBCA-0086)
(PB84-217124; CCA-83-14; NBS-GCR-84-464) Avail: NTIS HC A03/MF A01 CSCL 09B

Methods for transforming between data descriptions in different data models of the family of data model specifications developed by Computer Corporation of America for the National Bureau of Standards are described. The data models include the network, tree, and relational data models. In addition, guidelines are presented for converting databases corresponding to one of these data models to databases corresponding to another such model. GRA

N85-16519# National Bureau of Standards, Washington, D.C. Center for Analytical Chemistry.
FORTRAN VERSION OF THE QUANTITATIVE ENERGY-DISPERSIVE ELECTRON BEAM X-RAY ANALYSIS PROGRAM FRAME C
R. L. Myklebust and B. B. Thorne Jul. 1984 46 p
(PB84-240936; NBS-TN-1200) Avail: NTIS HC A03/MF A01; also avail. SOD as SN003-003-02603-4 CSCL 07D

A FORTRAN listing of the quantitative electron microprobe analysis routine, FRAME C, is presented. The source code is extensively documented and there are short summaries of the various parts of the program. Examples are also presented to demonstrate the versatility of the program. Author (GRA)

N85-16043# Joint Publications Research Service, Arlington, Va.
ART OF PROGRAMMING PROGRAMMABLE MICROCALCULATORS. PART 12: SOLUTION OF DIFFERENTIAL EQUATIONS Abstract Only
Ya. K. Trokhimenko and F. D. Lyubich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 36 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 56-62 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16055# Joint Publications Research Service, Arlington, Va.
TRENDS IN DEVELOPMENT OF SOFTWARE FOR COMPUTER-AIDED ANALYSIS OF LARGE-SCALE INTEGRATED CIRCUITS Abstract Only
I. P. Norenkov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 80 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 222-227 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16709# Brandeis Univ., Waltham, Mass. Dept. of Physics.
CORRELATOR AND DATA PROCESSING REQUIREMENTS FOR QUASAT
David H. Roberts *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 115-118 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16711# Academy of Sciences (USSR), Moscow. Inst. for Space Research.
PROCESSING SYSTEM FOR SPACE VLBI
S. V. Pogrebenko, M. V. Popov, and G. S. Tzarevsky *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 123-125 ref (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

62 COMPUTER SYSTEMS

Includes computer networks.

N85-16520 British Library Lending Div., Boston Spa (England).
RELIABILITY ANALYSIS OF LOCAL AREA NETWORKS, INTERMEDIATE REPORT
A. Laviron Feb. 1984 9 p Transl. into ENGLISH of French document
(BLL-WH-610-(9091.9F)) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

Specifications for a reference computational problem relating to the use of digital computer networks are developed. Work in the UK (UKAEA-ERA) had led to the evolution of a Local Area Network (LAN) with a capability to perform protective functions in a nuclear power station. The present study aims to model such networks to enable reliability analyses to be accomplished in such a way as to establish guide-lines for the choice of LAN structures. B.W.

N85-16521# Polytechnic of Central London (England).
LOCAL AREA NETWORK EVALUATION BY MICROSS EXTENSIONS Final Technical Report
Y. Paker Feb. 1984 84 p
(Grant DA-ERO-78-G110)
(AD-A146773) Avail: NTIS HC A05/MF A01 CSCL 09/2

This report reflects the work done during the third year of the three year project on Control, Synchronisation and Fault-Tolerant Operations in Variable Topology Multicomputer Systems. The overall purpose of the research work has been to investigate the architecture of a network of low cost computers (mini- or microcomputers) linked with serial communication paths which can be

reconfigured according to the needs of each computation. This led to a novel architecture named Variable Topology Multicomputer, or VTM for short, developed by a previous three year US European Office Grant. The second year's work has undertaken the evaluation of a number of interconnection topologies. The third, and the final, year of this work concentrated on extending MICROSS to be able to model local area networks (LAN's). During 1979-81, a distributed computing simulation package called MICROSS was designed and developed. This system enables a designer to enter the specifications for a multi-processor system in terms of topology, transmission line and processor characteristics in an interactive manner. Following a simulation phase the reporting is done by plotting performance figures such as delay times, throughput, etc. Thus MICROSS is a powerful package to evaluate various architectural approaches and topologies graphically in an interactive manner. GRA

N85-16522# Rijksuniversitair Centrum te Antwerpen (Belgium).
POSSIBILITIES AND IMPOSSIBILITIES OF MICROCOMPUTER SYSTEMS [DE (ON)MOGELIJKHEDEN VAN MICROCOMPUTER SYSTEMEN]
C. G. Langereis 18 May 1984 31 p refs In DUTCH
(AD-1984-904; B8470307) Avail: NTIS HC A03/MF A01

The future possibilities of personal computers or professional computers were investigated. The most recent developments are surveyed, with respect to the market as well as to technology. Specifications and criteria for the evaluation of microcomputers are given in order to compose a product matrix. Author (ESA)

N85-16377# World Meteorological Organization, Geneva (Switzerland).
A MICROPROCESSOR DATA SYSTEM FOR DEVELOPING COUNTRIES
Amos Eddy (Oklahoma Climatological Survey) *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 417-427 (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

63 CYBERNETICS

Includes feedback and control theory.

For related information see also *54 Man/System Technology and Life Support.*

N85-16523# Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering.
DECENTRALIZED CONTROL OF SCHEDULING IN DISTRIBUTED SYSTEMS Quarterly Report, 16 Dec. 1983 - 15 Mar. 1984
J. A. Stankovic 15 Mar. 1984 11 p
(AD-A147445) Avail: NTIS HC A02/MF A01 CSCL 12/1

The work in this quarter concentrated on three areas: scheduling algorithms based on bidding, scheduling algorithms for systems with hard real-time constraints and on scheduling based on stochastic learning automata. Section 2 of this report describes the progress made in these areas. GRA

64 NUMERICAL ANALYSIS

Includes iteration, difference equations, and numerical approximation.

N85-16524 British Library Lending Div., Boston Spa (England).
USE OF COORDINATE FUNCTIONS TO CALCULATE DEFORMATION FIELDS
A. M. Zolotov, K. N. Bogoyavlenskii, and L. B. Aksenov 3 Dec. 1984 10 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved., Chernaya Met. (USSR), no. 5, 1984 p 62-65
(BLL-M-36010-(5828.4)) Avail: British Library Lending Div., Boston Spa, England

A universal procedure employing coordinate functions and independent of the stress-state characteristics of the investigated process is proposed for calculating the speed fields of multiple-transition deformation processes. It provides a means of automating experimental data processing and graphic representation of the results of deformation calculations. The standard procedure in, for example, the method of finite elements, can be used to implement it with a computer. Author

N85-16525*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS ON VECTOR AND PARALLEL COMPUTERS Final Report
James M. Ortega and Robert G. Voigt Jan. 1985 174 p refs
(Contracts NAS1-17070; NAS1-17130)
(NASA-CR-172500; ICASE-85-1; NAS 1.26:172500) Avail: NTIS HC A08/MF A01 CSCL 12A

The present status of numerical methods for partial differential equations on vector and parallel computers was reviewed. The relevant aspects of these computers are discussed and a brief review of their development is included, with particular attention paid to those characteristics that influence algorithm selection. Both direct and iterative methods are given for elliptic equations as well as explicit and implicit methods for initial boundary value problems. The intent is to point out attractive methods as well as areas where this class of computer architecture cannot be fully utilized because of either hardware restrictions or the lack of adequate algorithms. Application areas utilizing these computers are briefly discussed. Author

N85-16526# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
SURFACE RECONSTRUCTION PRESERVING DISCONTINUITIES
J. L. Marroquin Aug. 1984 27 p
(Contracts DAAG29-84-K-0005; N00014-80-C-0505)
(AD-A146741; LIDS-P-1402; ARO-20980.4-MA) Avail: NTIS HC A03/MF A01 CSCL 12/1

This paper presents some experimental results that indicate the plausibility of using non-convex variational principles to reconstruct piecewise smooth surfaces from sparse and noisy data. This method uses prior generic knowledge about the geometry of the discontinuities to prevent the blurring of the boundaries between continuous subregions. The author includes examples of the application of this approach to the reconstruction of dynthetic surfaces, and to the interpolation of disparity data from the stereo processing of real images. Author (GRA)

N85-16527# Florida State Univ., Tallahassee. Dept. of Statistics.
ESTIMATION FOR A SEMIMARTINGALE REGRESSION MODEL USING THE METHOD OF SIEVES
I. W. McKeague Aug. 1984 17 p
(Contract DAAG29-82-K-0168)
(AD-A146809; FSU-Statistics-M686; TR-D-70-ARO; ARO-19367.17-MA) Avail: NTIS HC A02/MF A01 CSCL 12/1

Estimation by the method of sieves for a semimartingale regression model introduced by Aalen is studied. It is of interest to estimate functions which describe the influence of the covariates over time. An estimator for these functions is introduced and conditions which ensure consistency of the estimator in l sub 2 norm are given. Applications to diffusion processes and point processes with censored data are also discussed. Author (GRA)

N85-16528# Massachusetts Univ., Amherst. Dept. of Mathematics and Statistics.
AN OPERATOR METHOD FOR COMPUTING THE ASYMPTOTICS OF A COLLISION RESOLUTION INTERVAL
W. A. Rosenkrantz 29 Aug. 1984 20 p
(Grant AF-AFOSR-0167-82)
(AD-A146837; AFOSR-84-0919TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

The investigators present an operator method for obtaining upper and lower bounds for the expected length of a collision resolution interval for various protocols is presented. The method is elementary in that it circumvents the intricate and ingenious complex variable methods of Fayolle, Flajolet and Hofri (1983). The method can be applied to computing upper and lower bounds for the conditional delay. The problem of computing upper and lower bounds for the variances by this method remains open.
Author (GRA)

N85-16529# Florida State Univ., Tallahassee. Dept. of Statistics.
ON A RANDOM DIFFERENCE EQUATION FOR MATRICES AND A CHARACTERIZATION OF THE GAMMA DISTRIBUTION
E. S. Tollar Oct. 1984 24 p
(Contract DAAG29-82-K-0168)
(AD-A146858; FSU-STATISTICS-M676; TR-D-73-ARO; ARO-19367.18-MA) Avail: NTIS HC A02/MF A01 CSCL 12/1

The present paper considers the stochastic difference equation yn = MnYn-1 + Qn where Mn and Qn are respectively random d x d matrices and random d-vectors, and obtains some reasonable sufficient conditions on Mn and Qn under which Yn converges in distribution. In addition, a particular model is examined when d = 2, in which the asymptotic independence of Y1,n and Y2n, results in a characterization of the Gamma distribution.
Author (GRA)

N85-16530# Wisconsin Univ., Milwaukee. Dept. of Physics.
LATTICE STATISTICS Final Scientific Report, 1 Jul. 1983 - 30 Jun. 1984
R. B. McQuistan 30 Aug. 1984 13 p
(Grant AF-AFOSR-0192-81)
(AD-A146862; AFOSR-84-0880TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

The objective of this research was to develop the mathematical formalism necessary to treat a number of unsolved problems in lattice statistics. Toward that end the investigators have considered the following problems: (1) The occupational degeneracy of particles of various shapes on lattice spaces of various dimensionalities and structures. (2) The nearest neighbor degeneracy for various kinds of particles on lattice spaces of various dimensionalities and structures. (3) The kth neighbor problem for simple particles on a one dimensional, rectangular lattice space. Utilizing set theoretic arguments they have been able to construct shift operator matrices that, in principle, permit them to establish recursion relations that describe exactly the occupational degeneracy for any shape particle on a lattice space of any dimensionality and structure. Similar techniques allow the investigators to determine the composite nearest neighbor degeneracy for simple particles, dumbbells and lambda-bell particles on quasi-two dimensional rectangular lattices. They have utilized the forgoing formalism to treat the thermodynamics (canonical and grand partition functions) for such systems. Author (GRA)

N85-16531# Maryland Univ., College Park. Lab. for Numerical Analysis.
FEEDBACK, ADAPTIVITY AND A-POSTERIOR ESTIMATES IN FINITE ELEMENTS: AIMS, THEORY AND EXPERIENCE Final Report
I. Babuska Jun. 1984 33 p
(Contract N00014-77-C-0623; Grant NSF DMS-83-15316)
(AD-A146869; BN-1022) Avail: NTIS HC A03/MF A01 CSCL 12/1

The paper deals with the principles of the adaptive procedures in the finite element computations. It characterizes the aims and formulates typical theorems related to the subject. One and two dimensional numerical examples illustrate the applicability of the theory for practical computations. The paper reflects the invited lecture at the International Conference on Accuracy Estimates and Adaptive Refinement in Finite Element Computations, Lisbon, 1984. GRA

N85-16532# California Univ., Berkeley. Dept. of Civil Engineering.
SOLUTION OF FINITE ELEMENT PROBLEMS BY PRECONDITIONED CONJUGATE GRADIENT AND LANCZOS METHODS Final Report, May 1980 - Dec. 1983
R. L. Taylor and B. Nour-Omid Jun. 1984 36 p
(Contract N62583-83-M-T265; DA Proj. YR0-2303)
(AD-A146921; NCEL-CR-84.030) Avail: NTIS HC A03/MF A01 CSCL 12/1

The solution of nonlinear, transient finite element problems may be achieved by using step-by-step integration of the equations of motion combined with a Newton solution of the resulting nonlinear algebraic equations. The use of Newton type methods leads to a set of linear simultaneous algebraic equations whose solution gives the iterate. For very large problems the solution of the large set of linearized equations may be a formidable task - often consuming more than half of the computing effort when performed by a direct method based upon Gauss elimination. Accordingly, it is of considerable importance to investigate alternative methods to solve the problem. The present study presents results obtained by using a Preconditioned Conjugate Gradient Method (PCG) and a Preconditioned Lanczos Method (PLM) to solve a variety of numerical examples. Based upon results obtained it is evident that a significant reduction in overall effort, compared to direct solutions, may be achieved using the preconditioned methods. GRA

N85-16533# Brown Univ., Providence, R. I. Center for Dynamical Systems.
NUMERICAL METHODS AND APPROXIMATION AND MODELLING PROBLEMS IN STOCHASTIC CONTROL THEORY Interim Report, 1 Jan. - 30 Jun. 1984
W. H. Fleming and H. J. Kushner Aug. 1984 8 p
(Grant AF-AFOSR-0116-81)
(AD-A146927; AFOSR-84-0872TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

Research during this period continued in the following topic areas: (1) Nonlinear filtering; (2) Large deviations problems; (3) Stochastic control of piecewise-deterministic processes; (4) Stochastic variational calculus; (5) Approximating multiple Ito integrals with band-limited processes; (6) Large deviations methods and asymptotic properties of recursive algorithms; and (7) Approximation and modelling for distributed stochastic systems. Progress is summarized and a list of publications supported by the grant is included in the report. Author (GRA)

N85-16534# Virginia Univ., Charlottesville. Dept. of Systems Engineering.
OMNI TRANSFORMS: APPLICATIONS TO RENEWAL THEORY
M. Krakowski and C. Harris Sep. 1984 21 p
(Contract N00014-83-K-0624)
(AD-A146939; UVA/525393/SE84/103) Avail: NTIS HC A02/MF A01 CSCL 12/1

The theory of the renewal process has an important bearing on the single server queue, especially on the model M/G/1 (although some results are obtained for G/G/1 also). Since a renewal process can be viewed as a single-server saturated system (i.e., a system whose source keeps the server perpetually busy) this affinity is not surprising. Moreover, in deriving some results for the renewal process we gain insight into the use of the conservation method, based on the application of ergodic variables and of the so-called omni-transform, to the treatment of single-server queues. The renewal process adds insight into the theory of mixtures of random variables and of omni-forms (i.e., linear functions of omni-transforms). It allows to convert, when possible in principle, an omni-equation involving derivatives into an omni-equation without derivatives, an equation which is a statement about a mixture of distributions. Author (GRA)

N85-16535# Maryland Univ., College Park.
PERFORMANCE OF THE H, P AND H-P VERSIONS OF THE FINITE ELEMENT METHOD Final Report

I. Babuska, W. Gui, and B. Szabo Sep. 1984 23 p
(Contract N00014-77-C-0623)
(AD-A146940; BN-1027) Avail: NTIS HC A02/MF A01 CSCL 12/1

There are three basic versions of the finite element method, called the h, p and h-p versions. They are essentially characterized by the way in which the finite element meshes and polynomial degree of elements are chosen. They differ in computer implementation (program architecture) and mathematical analysis. This paper is concerned mainly with the question of how the meshes and polynomial degree of the elements affect the accuracy of finite element solutions. Our approach is to fix certain parameters or their relation and increase the number of degrees of freedom so that the finite element solutions converge to the exact solution. Such a systematic increase of the number of degrees of freedom is called extension because it can be interpreted as a systematic extension of finite element spaces. GRA

N85-16536# Naval Postgraduate School, Monterey, Calif.
A NOTE ON USING THE INTEGRATED FORM OF ARIMA FORECASTS
E. McKenzie Aug. 1984 20 p
(AD-A146965; NPS55-84-015) Avail: NTIS HC A02/MF A01 CSCL 12/1

Forecasts of ARIMA processes are generally made using the Difference Equation form. This is the approach favoured by Box and Jenkins and most subsequent authors. The purpose of this document is to emphasize that the Integrated Form of the forecast enjoys some important advantages derived from its explicit use of the Eventual Forecast Function (EFF). A brief review of the procedures for obtaining all the necessary components of the Integrated Form is given, and a new and direct method is derived for evaluating the extra coefficients necessary when the EFF does not yield the forecasts for all lead times. Author (GRA)

N85-16537# North Carolina Univ., Chapel Hill. Chapel Hill Dept. of Statistics.
ANALYTIC AND SEQUENTIAL FEYNMAN INTEGRALS ON ABSTRACT WIENER AND HILBERT SPACES, AND A CAMERON-MARTIN FORMULA. REVISION Technical Report
G. Kallianpur, D. Kannan, and R. L. Karandikar Jan. 1984 43 p
(Contract F49620-82-C-0009)
(AD-A146969; TR-53; AFOSR-84-0863TR) Avail: NTIS HC A03/MF A01 CSCL 12/1

Sequential Feynman integrals are defined for classes of functions on a Hilbert space and on an abstract Weiner space. A Cameron-Martin formula is proved for analytic and sequential Feynman integrals for two classes. GRA

N85-16538# Colorado Univ., Boulder. Dept. of Computer Science.
CONTINUITY OF THE NULL SPACE BASIS AND CONSTRAINED OPTIMIZATION
R. H. Byrd and R. B. Schnabel Sep. 1984 19 p
(Contract DAAG29-81-K-0108; Grant NFS MCS-81-15475)
(AD-A147038; CU-CS-272-84; ARO-18197.5-MA) Avail: NTIS HC A02/MF A01 CSCL 12/1

Many constrained optimization algorithms use a basis for the null space of the matrix of constraint gradients. Recently, methods have been proposed that enable this null space basis to vary continuously as a function of the iterates in a neighborhood of the solution. This paper reports results from topology showing that, in general, there is no continuous function that generates the null space basis of all full rank rectangular matrices of a fixed size. Thus constrained optimization algorithms cannot assume an everywhere continuous null space basis. We also give some indication of where these discontinuities must occur. We then propose an alternative implementation of a class of constrained optimization algorithms that uses approximations to the reduced Hessian of the Lagrangian but is independent of the choice of null space basis. This approach obviates the need for a continuously varying null space basis. GRA

N85-16539# California Univ., Santa Barbara. Dept. of Electrical and Computer Engineering.
TECHNIQUES FOR VECTOR QUANTIZATION Final Report, 1 Oct. 1982 - 30 Sep. 1983
A. Gersho Aug. 1984 11 p
(Grant AF-AFOSR-0008-82)
(AD-A147052; AFOSR-84-0897TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

The second year of AFOSR support at the University of California, Santa Barbara has allowed us to make significant strides in exploring the potential of vector quantization for source coding. Some of this work is described in the attached list of references. Some of the studies were completed, including predictive vector quantization and rate distortion modeling of speech using a composite source model to obtain rate distortion bounds on performance of vector quantization. Particularly important results in the second year include the development of a new family of fast search algorithms for pattern matching and the development of Hierarchical Vector Quantization. Several other promising studies, including compandor/lattice coding, were still in progress when the grant terminated. Author (GRA)

N85-16540# Colorado Univ., Boulder. Dept. of Computer Science.
TRUST REGION METHODS FOR MINIMIZATION Final Report, 15 Jun. 1981 - 14 Jun. 1984
R. B. Schnabel 5 Oct. 1984 17 p
(Contract DAAG29-81-K-0108)
(AD-A147073; ARO-18197.6-MA) Avail: NTIS HC A02/MF A01 CSCL 12/1

This research project investigated a number of topics in unconstrained optimization, constrained optimization, and solving systems of nonlinear equations. The biggest accomplishment was the development of a new class of of methods, called tensor methods, for solving systems of nonlinear equations. These methods led to large increases in efficiency over standard methods on extensive batteries of test problems, with especially large gains on problems with singular Jacobians at the solution. The other major accomplishment was the development of a unified theory of trust region methods for unconstrained optimization. Our theory shows how line search, dogleg, or optimal step methods can be constructed that satisfy first and second order conditions for convergence. Research was also completed on conic methods for optimization, on secant methods that satisfy multiple secant equations, and on issues concerned with the computation of null space bases in constrained optimization. Research was initiated on computational methods for nonlinear least squares problems with errors in the independent variables, and in parallel algorithms for optimization. GRA

N85-16541# Colorado School of Mines, Golden. Center for Wave Phenomena.
[RESEARCH OF INVERSE METHODS TO DESCRIBE THE STRUCTURE OF THE EARTH AND OCEAN BOTTOM] Progress Report
N. Bleistein, J. K. Cohen, F. G. Hagin, and J. A. DeSanto 1 Oct. 1984 17 p
(Contract N00014-84-K-0049)
(AD-A147082; CWP-016) Avail: NTIS HC A02/MF A01 CSCL 12/1

The objective of our research is to produce inverse methods to describe the structure of the earth and the oceans for seismic exploration, seabed mapping and ocean modeling. All of the problems we treat are nonlinear. Our approach is to derive approximate solutions of linearized problems which estimate the earth or ocean parameters as perturbations from a known background structure. Thus, the closer the background structure is to the true medium, the smaller the perturbations and the more accurate the inversion methods. This is the reason for our desire for inversion techniques for progressively more complex background structure. There is a fundamental idea which pervades our research, namely, asymptotic inversion of data for structure and parameter estimation. Asymptotics arise naturally in the problems

we model since most length scales of the problem are many wavelengths long. We model the experiment of interest by deriving an integral representation for the observed wavefield produced by the experiment. GRA

N85-16542# Illinois Univ., Chicago. Chicago Circle Statistical Lab.
A COMPLETE CHARACTERIZATION OF TRIPLY BALANCED MATRICES WITH APPLICATIONS TO SURVEY SAMPLING
A. Hedayat and H. Pesotan Aug. 1984 14 p Prepared in cooperation with Guelph Univ., Ontario
(Grant AF-AFOSR-0170-80)
(AD-A147083; TR-84-5; AFOSR-84-0870TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

R x L triply balanced matrices arise in cross validation studies and in estimating the mean square errors of nonlinear statistics in many large scale survey samplings. It is shown that: (1) Any R x L triply balanced matrix and an orthogonal array OA(R,L,2,3; lambda) are one and the same object up to a possible notational change of the two symbols of the array to + and - respectively, (2) R is a multiple of 8 and L < or = R/2, and (3) The problem of the construction of R x L triply balanced matrices, 3 < or = L < or = R/2, is completely resolved modulo the existence of Hadamard matrices of order R/2. Author (GRA)

N85-16543# Mississippi State Univ., Mississippi State. Dept. of Aerophysics and Aerospace Engineering.
CONVECTION SCHEMES FOR USE WITH CURVILINEAR COORDINATE SYSTEMS: A SURVEY Final Report, Aug. 1981 - Feb. 1983
J. F. Thompson Jun. 1984 272 p
(Contract DACW39-81-C-0069)
(AD-A147093; WES/MP/E-84-4) Avail: NTIS HC A12/MF A01 CSCL 12/1

Numerical methods for the simulation of convection of concentration profiles with strong gradients are surveyed with regard to use on general boundary-conforming curvilinear coordinate systems in multiple dimensions in time-dependent problems. Particular attention is given to the requirements for reduced dissipation and dispersion. Desirable characteristics of methods are identified and some particularly appropriate schemes are noted. Author (GRA)

N85-16544# Wisconsin Univ., Madison. Mathematics Research Center.
STABLE MONOTONE VARIATIONAL INEQUALITIES Technical Summary Report
L. McLinden Aug. 1984 57 p
(Contract DAAG29-80-C-0041; Grant NSF DMS-84-05179)
(AD-A147123; MRC-TSR-2734) Avail: NTIS HC A04/MF A01 CSCL 12/1

Variational inequalities associated with monotone operators (possibly nonlinear and multivalued) and convex sets (possibly unbounded) are studied in reflexive Banach spaces. A variety of results are given which relate to a stability concept involving a natural parameter. These include characterizations useful as criteria for stable existence of solutions and also several characterizations of subjectivity. The monotone complementarity problem is covered as a special case, and the results are sharpened for linear monotone complementarity and for generalized linear programming. Author (GRA)

N85-16545# California Univ., Berkeley. Operations Research Center.
BAYESIAN ESTIMATION OF UNDETECTED ERRORS
W. S. Jewell Oct. 1983 41 p
(Grant AF-AFOSR-0122-81)
(AD-A147198; ORC-83-11) Avail: NTIS HC A03/MF A01 CSCL 12/1

An unknown number, N, of errors exist in a certain product, for example, defects in a production lot, errors in a manuscript, or bugs in a computer program. I inspectors with possibly different competencies are to be put to work to find the errors. How should the inspection be organized, and what is a good estimate of the undetected errors (or of N)? This problem is similar to the capture-recapture sampling problem of population biology, assuming a closed population and a parallel search effort, for which many classical results are available. Apart from an elementary analysis of the I = 2 case by Gaskell and George and some sequential sampling plans by Freeman, the only Bayesian approach to this problem appears to be by Castledine, who obtains rather complicated results appropriate to the population biology model. This paper, develops the model in a manner more related to error detection problems. GRA

N85-16546# Wisconsin Univ., Madison. Mathematics Research Center.
THE THEORY OF OPTIMAL CONFIDENCE LIMITS FOR SYSTEMS RELIABILITY WITH COUNTEREXAMPLES FOR RESULTS ON OPTIMAL CONFIDENCE LIMITS FOR SERIES SYSTEMS Technical Summary Report
B. Harris and A. P. Soms Aug. 1984 23 p
(Contracts DAAG29-80-C-0041; N00014-79-C-0321)
(AD-A147236; MRC-TSR-2726) Avail: NTIS HC A02/MF A01 CSCL 12/1

This paper gives the general theory of optimal confidence limits for systems reliability introduced by Buehler (1957). This is specialized to series systems. It is noted that some results previously given are false. In particular, counter-example for results of Sudakov (1974), Winterbottom (1974) and Harris and Soms (1980, 1981) are given. Numerical examples are provided, which suggest that despite the theoretical problems of the results, they are nevertheless valid for significance levels likely to be used in practice. GRA

N85-16547# Wisconsin Univ., Madison. Mathematics Research Center.
A DUAL QUADRATIC PROGRAMMING ALGORITHM Technical Summary Report
K. Ritter Aug. 1984 23 p
(Contract DAAG29-80-C-0041)
(AD-A147237; MRC-TSR-2733) Avail: NTIS HC A02/MF A01 CSCL 12/1

By using conjugate directions a method for solving convex quadratic programming problems is developed. The algorithm generates a sequence of dual feasible solutions and terminates after a finite number of steps. GRA

N85-16548# Wisconsin Univ., Madison. Mathematics Research Center.
SELF SIMILAR SOLUTIONS FOR A DEGENERATE CAUCHY PROBLEM Technical Summary Report
K. Hoellig and J. A. Nohel Aug. 1984 12 p
(Contract DAAG29-80-C-0041)
(AD-A147241; MRC-TSR-2728) Avail: NTIS HC A02/MF A01 CSCL 12/1

Degenerate parabolic equations arise in the description of melting processes, gas dynamics and certain biological models. The interfaces corresponding to degeneracies in the constitutive function usually separate different media in the physical problem. The particular problem stated in the abstract is related to nonlinear diffusion equations with nonmonotone constitutive functions. In this report the authors obtain self-similar solutions for (P) for a class of model initial data. The qualitative behavior of these solutions, in particular of their interfaces, is typical of the situation in more general problems. In a subsequent report with Vazquez they use such self-similar solutions as comparison functions to study the regularity and the behavior for small time of the interfaces for problem (P) with phi(v) = max(0,phi(v)) where phi is strictly monotone increasing. GRA

N85-16549# Wisconsin Univ., Madison. Mathematics Research Center.
ASYMPTOTIC BEHAVIOUR OF THE PLASMA EQUATION Technical Summary Report
Y. C. Kwong Aug. 1984 61 p

(Contract DAAG29-80-C-0041)
(AD-A147242; MRC-TSR-2727) Avail: NTIS HC A04/MF A01 CSCL 12/1

This paper is concerned with a plasma equation. It is known that there exists a finite extinction time T* such that the solution decays to zero at T*. Recently, Berryman and Holland investigated the stability of the profile of the solution as t approaches limit of T*. However, they obtained their results at the expense of some very strong regularity assumptions. This paper, proves the same kind of results without those strong regularity assumptions. By invoking both the nonlinear semi-group theory and a standard regularizing scheme for the equation, the author measures rate of decay of the solution and obtains estimates on the time derivative as t infinity T*. As motivated by the regularity assumptions, both the interior and boundary regularities of the solution are studied. Finally, he perturbs the nonlinearity of the plasma equation and studies the same aspects for the perturbed equation. GRA

N85-16550# Wisconsin Univ., Madison. Mathematics Research Center.
A COUNTEREXAMPLE TO A RESULT OF STRANG AND FIX CONCERNING CONTROLLED APPROXIMATION Technical Summary Report
R. Q. Jia Sep. 1984 18 p
(Contract DAAG29-80-C-0041; Grant NSF MCS-82-10950)
(AD-A147360; AD-F300486; MRC-TSR-2743) Avail: NTIS HC A02/MF A01 CSCL 12/1

In finite element analysis is it is important to choose appropriate trial functions. One approach to such a choice has been described by Strang as follows: Choose one or more locally supported functions phi sub 1 phi sub n rescale the independent variable, and translate the functions just constructed. A principal question in finite element analysis is how well a given function can then be approximated by those trial functions. This is measured by the order of approximation. Sometimes it is required that the coefficients in the process of approximation be bounded. Such an approximation is said to be controlled. A result of Strang and Fix states that if a collection of locally supported elements has controlled approximation of order k, then there is a finite linear combination omega of those elements and their translates such that any polynomial of degree less than k can be reproduced by omega nd its translates. This result has been questioned for some time. Recently, the rapid development of the theory of multivariate spline functions has given a new impetus to the controlled approximation problem. It becomes significant to answer the question whether their result is correct. This paper gives a counterexample to the result of Strang and Fix. The author's conclusion suggests that the controlled approximation order should be refined. Hopefully, the result in this paper will lead to further development of finite element analysis. GRA

N85-16551# Wisconsin Univ., Madison. Mathematics Research Center.
THE STABLE EVALUATION OF MULTIVARIATE B-SPLINES Technical Summary Report
T. A. Grandine Sep. 1984 18 p
(Contract DAAG29-80-C-0041)
(AD-A147386; MRC-TSR-2744) Avail: NTIS HC A02/MF A01 CSCL 12/1

For one variable, the problem of stably evaluating B-splines via their recurrence relations is well understood. For multivariate B-splines, however, the geometry becomes a more complex, and it becomes quite difficult to implement the recurrence relations in such a way that one ends up with a robust evaluation method. This paper gives a general method for the stable evaluation of multivariate B-splines. The problem of evaluation along mesh boundaries is discussed in detail. Several examples are presented to demonstrate the effectiveness of the method for arbitrary B-splines. Originator-supplied keywords include: Simplex spline, Recurrence relation, and Simplex method. GRA

N85-16552# Wisconsin Univ., Madison. Mathematics Research Center.
SOME APPLICATIONS OF PENALTY FUNCTIONS IN MATHEMATICAL PROGRAMMING Technical Summary Report
O. L. Mangasarian Jul. 1984 30 p
(Contract DAAG29-80-C-0041; Grant NSF MCS-82-00632)
(AD-A147443; MRC-TSR-2720) Avail: NTIS HC A03/MF A01 CSCL 12/1

Penalty function minimization is a useful technique for converting constrained optimization problems to simpler unconstrained optimization problems. One difficulty with this approach has been the determination of the size of an adequate penalty parameter. This work shows how to choose precisely the penalty parameter in order to meet any preassigned accuracy. In addition penalty functions are used to obtain bounds on the size of a solution of a constrained optimization problem without solving it. The authors also shows how his results can be used to solve huge sparse linear programs to any desired degree of accuracy. GRA

N85-16553# Wisconsin Univ., Madison. Mathematics Research Center.
VISCOSITY SOLUTIONS OF HAMILTON-JACOBI EQUATIONS AT THE BOUNDARY Technical Summary Report
M. G. Crandall and R. Newcomb Jul. 1984 15 p
(Contract DAAG29-80-C-0041)
(AD-A147444; MRC-TSR-2723) Avail: NTIS HC A02/MF A01 CSCL 12/1

At the classical level, when one considers boundary value problems for nonlinear scalar first order partial differential equations there are parts of the boundary where one does not expect to be able to prescribe boundary data. Likewise, uniqueness theorems can be proved for solutions which are prescribed only on parts of the boundary. However, globally defined classical solutions of first order nonlinear problems are rare, owing to the formation of shocks. This theoretical difficulty has recently been overcome for equations of Hamilton-Jacobi type via the development of the theory of viscosity solutions, a sort of generalized solution for which good existence and uniqueness theorems hold. This note is concerned, in the context of viscosity solutions, with identifying parts of the boundary which are irrelevant for a given equation from the point of view of requiring data in order to prove uniqueness. This involves knowing when a viscosity solution of an equation (in the viscosity sense) in the interior of the domain may be extended by continuity to a solution in the viscosity sense to points on the boundary. The results obtained to this effect are supplemented by examples delimiting their sharpness. GRA

N85-16554# Wisconsin Univ., Madison. Mathematics Research Center.
SPLITTING METHODS FOR THE NUMERICAL SOLUTION OF THE INCOMPRESSIBLE NAVIER-STOKES EQUATIONS Technical Summary Report
R. Glowinski Sep. 1984 49 p
(Contract DAAG29-80-C-0041)
(AD-A147463; MRC-TSR-2741) Avail: NTIS HC A03/MF A01 CSCL 12/1

Splitting methods provide efficient tools for solving linear and nonlinear time dependent problems modelled by partial differential equations. In this report we discuss the numerical solution of the Navier-Stokes equations for incompressible viscous fluids by such methods. The splitting permits decoupling the two main difficulties in the problem, namely the nonlinearity and the incompressibility. Actually these splitting methods have a broad range of applicability and can be applied for example, to the solution of eigenvalue problems. Originator supplied keywords include: operator splitting methods, nonlinear least squares, preconditioned conjugate gradient algorithms, finite element approximations, eigenvalue calculation, and variational methods. GRA

N85-16555# Wisconsin Univ., Madison. Mathematics Research Center.
AN ITERATIVE SCHEME FOR LINEAR COMPLEMENTARITY PROBLEMS Technical Summary Report
T. H. Shiau Aug. 1984 20 p
(Contract DAAG29-80-C-0041; Grant NSF MCS-82-00632)

(AD-A147464; MRC-TSR-2737) Avail: NTIS HC A02/MF A01 CSCL 12/1

The linear complementarity problem (LCP) is an important problem in mathematical programming for solving linear programming, quadratic programming and bimatrix games. This work gives a new scheme for solving the LCP. Based on the scheme, different algorithms may be designed for finding approximate solutions of very large scale problems or exact solutions of moderate LCPs. A specific algorithm for the latter is given, together with some numerical results. These indicate that the method is more effective than other existing methods. GRA

N85-16556# Wisconsin Univ., Madison. Mathematics Research Center.

MODEL ROBUST RESPONSE SURFACE DESIGNS: SCALING 2-LEVEL FACTORIALS Technical Summary Report

D. M. Steinberg Jul. 1984 38 p

(Contract DAAG29-80-C-0041; Grant NSF MCS-82-10950)

(AD-A147494; AD-F300490; MRC-TSR-2721) Avail: NTIS HC A03/MF A01 CSCL 12/1

In response surface methodology, carefully designed experiments are used to study the relationship between an experimental response variable and a set of continuous explanatory variables. The experiments are designed to permit estimation of the parameters of a simple graduating function which, it is tentatively assumed, will provide a reasonable approximation to the true response function. These designs usually involve only a few levels of each explanatory variable, so the experimenter must decide how far apart to choose the levels. If the levels are too close together, estimates from the model will have high variance, but if the levels are too far apart, the graduating function may no longer adequately approximate the true response function, leading to large bias errors. An effective resolution of these conflicting demands must depend on the experimenter's beliefs as to the adequacy of the graduating function. Bayesian statistical methods allow us to formulate a model that includes explicit assumptions about the experimenter's beliefs. The author formulated an experimental design criterion based on such a model and studies the implications of the criterion for scaling two-level factorial experiments, which are often used when the graduating function is a first degree polynomial. It is shown that the criterion leads to reasonable choices of scale that are not highly sensitive to the experimenter's beliefs. GRA

N85-16557# Wisconsin Univ., Madison. Mathematics Research Center.

NONLINEAR SEMIGROUPS AND EVOLUTION GOVERNED BY ACCRETIVE OPERATORS

M. G. Crandall Aug. 1984 53 p

(Contract DAAG29-80-C-0041)

(AD-A147556; MRC-TSR-2724) Avail: NTIS HC A04/MF A01 CSCL 12/1

This is a review paper which outlines the main points of the theory of nonlinear semigroups and evolution governed by accretive operators. The subject is now rather mature, so most of the principal ideas and results are not new. However, the presentation here is organized differently from that in other sources and does touch upon recent results. An attempt has been made to make this paper a pleasant route to a certain view of the subject. This manuscript represents the author's contribution to the proceedings of the Symposium on Nonlinear Functional Analysis and Applications held in Berkely in July 1983. Author (GRA)

N85-16558# Naval Postgraduate School, Monterey, Calif.

EXTRACTING EMBEDDED GENERALIZED NETWORKS FROM LINEAR PROGRAMMING PROBLEMS Technical Report

G. G. Brown, R. D. McBride, and R. K. Wood Sep. 1984 26 p

(AD-A147565; NPS55-84-020) Avail: NTIS HC A03/MF A01 CSCL 12/1

If a linear program (LP) possesses a large generalized network (GN) submatrix, this structure can be exploited to decrease solution time. The problems of definding maximum sets of GN constraints and finding maximum embedded GN submatrices are shown to be NP-complete indicating that reliable, efficient solution of these problems is difficult. Therefore, efficient heuristic algorithms are developed for identifying such structure and are tested on a selection of twenty-three real-world problems. The best of four algorithms for identifying GN constraint sets finds a set which is maximum in twelve cases and average 99.1% of maximum. On average, the GN constraints identified comprise more than 62.3% of the total constraints in these problems. The algorithm for identifying embedded GN submatrices finds submatrices whose sizes, rows plus columns, average 96.8% of an LP upper bound. Over 91.3% of the total constraint matrix was identified as a GN submatrix in these problems, on average. Originator supplied keywords include: embedded networks, computational complexity, and large-scale optimization. GRA

N85-16559# Stanford Univ., Calif. Lab. for Computational Statistics.

BOOTSTRAP CONFIDENCE INTERVALS

R. J. Tibshirani Oct. 1984 25 p

(Contracts N00014-83-K-0472; N00014-81-K-0340; DAAG29-82-K-0056; DE-AC03-76SF-00515; DE-AT03-ER-10843)

(AD-A147572; LCS-TR-3) Avail: NTIS HC A02/MF A01 CSCL 12/1

We describe the various techniques that were proposed for constructing non-parametric confidence intervals using the bootstrap. These include bootstrap pivotal intervals, percentile and bias-corrected percentile intervals, and non-parametric titling intervals. These methods are small sample improvements over the usual + or - standard deviation intervals. We discuss them in detail, outlining underlying assumptions in each case. We show how the non-parametric titling interval can be viewed as an extension of a bootstrap pivotal interval, and suggest a number of generalizations. Finally, the various intervals are compared in a small simulation study. GRA

N85-16560# Wisconsin Univ., Madison. Mathematics Research Center.

ON EXISTENCE AND UNIQUENESS OF SOLUTIONS OF HAMILTON-JACOBI EQUATIONS Technical Summary Report

M. G. Crandall and P. L. Lions Jul. 1984 29 p

(Contract DAAG29-80-C-0041)

(AD-A147597; MRC-TSR-2719) Avail: NTIS HC A03/MF A01 CSCL 12/1

The theory of scalar first order nonlinear partial differential equations has been enjoying a rapid development in the last few years. This development occurred because the authors established uniqueness criteria for generalized solutions - called viscosity solutions - which correctly identify the solutions sought in areas of application, including control theory, differential games and the calculus of variations. The concept of viscosity solutions is relatively easy to work with and many formally heuristic or difficult proofs have been made rigorous or simple using this concept. A feedback process has begun and the experience recently gained in working with viscosity solution has suggested new existence and uniqueness results. The current paper continues this interaction by establishing new existence ane uniqueness results in a natural generality suggested by earlier proofs. It is also felt that the presentation of the comparison results, which imply uniqueness, continuous dependence, and are used to estimate moduli of continuity, has something to offer over earlier presentations in special cases.(Author) GRA

N85-16561# Educational Testing Service, Princeton, N. J.

CONJUNCTIVE AND DISJUNCTIVE ITEM RESPONSE FUNCTIONS

F. M. Lord Oct. 1984 37 p

(Contract N00014-83-C-0457)

(AD-A147815) Avail: NTIS HC A03/MF A01 CSCL 12/1

Given that the examinee knows the answer to item i if and only if he knows the answer to both item g and item h, a conjunctive item response model is found such that items g, h, and i all have the same mathematical form of response function. Since such items may occur in practice, it is desirable that item response models satisfy this condition. For models with two parameters per

item, the most general functional form satisfying this condition is found. A third, guessing parameter may be added. The corresponding disjunctive model is also derived. Author (GRA)

N85-16562# University of Northern Illinois, De Kalb. Dept. of Mathematical Sciences.
SEQUENTIAL AND PARALLEL MATRIX COMPUTATIONS Interim Report, 1 Sep. 1983 - 31 Aug. 1984
Biswa Nath Datta Oct. 1984 8 p
(Grant AF-AFOSR-0334-83)
(AD-A147871; AFOSR-84-0957TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

During this period the investigator worked on the development of parallel algorithms to be used in the following linear algebra areas --- stability and inertia problems, controllability and observability problems, pole assignment problems, and matrix equations problems (Sylvester, Lyapunov, Riccati, etc). In particular, algorithms have been developed which require O (n log n) steps for solution on O (n 2) processors. Several presentations on these results were given, including a talk at the SIAM Fall Meeting. Three papers have been accepted for publication and several more are in preparation. GRA

N85-16563# North Carolina Univ., Chapel Hill. Dept. of Statistics.
CONDITIONAL REGRESSION MODELS FOR TRANSIENT STATE SURVIVAL ANALYSIS
Robert D. Abbott (National Heart, Lung and Blood Inst., Bethesda, Md.) and Raymond J. Carroll Aug. 1984 17 p
(Contract F49620-82-C-0009)
(AD-A147872; MIMEO SER-1555; AFOSR-84-0951TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

Survival models are important tools for the analysis of data when a disease event occurs with time and subjects are lost to follow-up. Many models, however, can also be adapted for use when an event is characterized by transitions through intermediate states of disease with increasing severity. In this presentation, such an adaptation will be demonstrated for a class of conditional regression models for the analysis of transient state events occurring among grouped event times. The type of conditioning that will be described is useful in providing comparisons of specific disease states and an assessment of transition dependent risk factor effects. An example will be given based on the Framingham Heart Study. Author (GRA)

N85-16564# North Carolina State Univ., Raleigh. Dept. of Computer Science.
STRUCTURAL OPTIMIZATION AND OTHER LARGE-SCALE PROCESSES Annual Scientific Report, 15 Jul. 1983 - 14 Jul. 1984
R. J. Plemmons 15 Sep. 1984 8 p
(AD-A147895; AFOSR-84-0947TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

Fast algorithms for solving numerical problems involving large sparse matrix computations are investigated. Applications of this work to the areas of structural analysis, constrained optimization and large scale least squares adjustment methods are developed. One of the more important accomplishments is the design and testing on the Denelcor HEP multiprocessor of a parallel algorithm for computing a banded basis matrix for the null space. This algorithm may lead to a new efficient sparse matrix implementation of the force method for the finite element analysis of large-scale structures. GRA

N85-16252*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ESTIMATING LOCATION PARAMETERS IN A MIXTURE
R. P. Heydorn and M. V. Martin (Lockheed Engineering and Management Services Co., Inc.) *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 1-26 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16254*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
TEXTURE CLASSIFICATION USING AUTOREGRESSIVE FILTERING
Wayne M. Lawton and Meemong Lee *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 51-99 refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16257*# Texas A&M Univ., College Station. Center for Approximation Theory.
MULTIVARIATE SPLINE METHODS IN SURFACE FITTING
L. F. Guseman, Jr., Principal Investigator and L. L. Schumaker *In its* Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 137-163 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16261*# Maryland Univ., College Park. Center for Automation Research.
EVIDENCE ACCUMULATION FOR SPATIAL REASONING
Takashi Matsuyama, Vincent Shang-Shoug Hwang, and Larry S. Davis *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 245-302 refs Previously announced as N84-29302 Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16263*# Purdue Univ., Lafayette, Ind. School of Civil Engineering.
RECTIFICATION OF SINGLE AND MULTIPLE FRAMES OF SATELLITE SCANNER IMAGERY USING POINTS AND EDGES AS CONTROL
Fidel C. Paderes, Jr., Edward M. Mikhail, and Wolfgang Foerstner (Stuttgart Univ., West Germany) *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 309-400 refs ERTS (For primary document see N85-16251 07-43)
(Contract NAS9-16664)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16266*# SRI International Corp., Menlo Park, Calif. Artificial Intelligence Center.
IMAGE-TO-IMAGE CORRESPONDENCE: LINEAR STRUCTURE MATCHING
Grahame B. Smith and Helen C. Wolf *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 467-487 refs Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S.D. 57198 ERTS (For primary document see N85-16251 07-43)
(Contracts NAS9-16664; MDA903-83-C-0027)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16267*# Maryland Univ., College Park.
ANALYSIS OF SUBPIXEL REGISTRATION
Carlos A. Berenstein, Laveen N. Kanal, David Lavine, Eric C. Olson, and Eric Slud *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 489-594 refs Prepared in cooperation with LNK Corp., Silver Spring, Md. ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

65 STATISTICS AND PROBABILITY

Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

N85-16565*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPLINE METHODS FOR APPROXIMATING QUANTILE FUNCTIONS AND GENERATING RANDOM SAMPLES
James R. Schiess and Christine G. Matthews (Computer Sciences Corp.) Jan. 1985 34 p refs
(NASA-TP-2389; L-15850; NAS 1.60:2389) Avail: NTIS HC A03/MF A01 CSCL 12A

Two cubic spline formulations are presented for representing the quantile function (inverse cumulative distribution function) of a random sample of data. Both B-spline and rational spline approximations are compared with analytic representations of the quantile function. It is also shown how these representations can be used to generate random samples for use in simulation studies. Comparisons are made on samples generated from known distributions and a sample of experimental data. The spline representations are more accurate for multimodal and skewed samples and to require much less time to generate samples than the analytic representation. M.G.

N85-16566# Iowa Univ., Iowa City. Dept. of Statistics and Acturial Science.
ON THE POWER FUNCTIONS OF TEST STATISTICS IN ORDER RESTRICTED INFERENCE
H. Mukerjee (California Univ., Davis), T. Robertson, and F. T. Wright (Missouri Univ., Rolla) Oct. 1984 54 p
(Contracts N00014-80-C-0321; N00014-80-C-0322)
(AD-A147126; TR-107) Avail: NTIS HC A04/MF A01 CSCL 12/1

We study the power function of both the likelihood ratio and contrast statisiics for detecting a totally ordered trend in a collection of means of normal populations. Monotonicity properties are found and both radial limits and limits along lines parallel to the cone of points satisfying the trend are examined. An optimal contrast test for testing a trend as a null hypothesis is derived. Author (GRA)

N85-16567# Washington Univ., Seattle.
CONDITIONALLY HETEROSCEDASTIC AUTOREGRESSIONS Technical Report, 1 Jan. 1982 - 30 Nov. 1983
A. F. L. Nemec Apr. 1984 35 p
(Contract N00014-82-K-0062)
(AD-A147168; TR-43) Avail: NTIS HC A03/MF A01 CSCL 12/1

Two conditionally heteroscedastic autoregressions are considered. It is shown that under suitable conditions, the processes are stationary and ergodic, and that the stationary initial distribution can be represented by a nonlinear function of independent, identically distributed standard Normal random variables.
Author (GRA)

N85-16568# North Carolina Univ., Chapel Hill. Center for Stochastic Processes.
THE SYMMETRY GROUP AND EXPONENTS OF OPERATOR STABLE PROBABILITY MEASURES
W. N. Hudson, Z. J. Jurek, and J. A. Veeh Aug. 1984 17 p Prepared in cooperation with Tufts Univ. and Auburn Univ.
(Contract F49620-82-C-0009)
(AD-A147187; TR-72; AFOSR-84-0916TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

There exists exponents of an operator stable measure which commute with every operator in the measure's symmetry group. These exponents together with a new norm lead to some simplifications in the representation of the Levy measure.
Author (GRA)

N85-16569# Wisconsin Univ., Madison. Mathematics Research Center.
RESPONSE SURFACE DESIGNS Technical Summary Report
N. R. Draper Aug. 1984 29 p
(Contract DAAG29-80-C-0041)
(AD-A147202; AD-E850747; MRC-TSR-2729) Avail: NTIS HC A03/MF A01 CSCL 12/1

The fitting of first and second degree equations to experimental data in order to summarize the main features of the underlying but unknown mechanism, is a useful and widely used technique. In addition to its interpretive value, it often provides information about the mechanism. Certain ways of obtaining the data are better than others. Criteria for choice of a suitable response surface design, and specific designs that have excellent characteristics with respect to those criteria, are described in this expository article. Various other related features, suggestions for further reading, and a list of basic references are included. Author (GRA)

N85-16570# Naval Postgraduate School, Monterey, Calif.
PARI-MUTUEL AS A SYSTEM OF AGGREGATION OF INFORMATION Technical Report, 1 Mar. - 30 Sep. 1984
G. Owen Oct. 1984 28 p
(RR0-0010)
(AD-A147210; NPS53-85-0001) Avail: NTIS HC A03/MF A01 CSCL 12/1

A bettor is faced with the problem of choosing optimal bets, given his (subjective) probabilities of outcomes of an experiment and the payoff odds on these outcomes. Conversely, a bookie (pari-mutuel system), faced by several bettors with different subjective probabilities, has the problem of choosing payoff odds so as to avoid the risk of loss. It is shown that, under certain reasonably broad conditions on the several bettors' utilities and subjective probabilities, such an equilibrium set of payoff odds always exists. Some examples are worked out in detail. GRA

N85-16571# Stanford Univ., Calif. Lab. for Computational Statistics.
LOCAL LIKELIHOOD ESTIMATION
R. J. Tibshirani Sep. 1984 60 p
(Contract N00014-83-K-0472)
(AD-A147317; LCS-TR-4) Avail: NTIS HC A04/MF A01 CSCL 12/1

This paper extends the idea of local averaging to likelihood based models. One such application is to the class of generalized linear models. The author enlarges this class by replacing the covariate from chi beta with an unspecified smooth function. This function is estimated from the data by a technique called Local Likelihood Estimation - a type of local averaging. Multiple covariates are incorporated through a forward stepwise algorithm. The main application discussed however, is to the proportional hazards model of Cox (1972), for censored data. In a number of real data examples, the local likelihood technique proves to be effective in uncovering non-linear dependencies. Finally, the author gives some asymptotic results for local likelihood estimates and provides some methods for inference. GRA

N85-16572# Chicago Univ., Ill. Center for Decision Research.
AMBIGUITY AND UNCERTAINTY IN PROBABILISTIC INFERENCE
H. J. Einhorn and R. M. Hogarth Jun. 1984 84 p
(Contract N00014-84-C-0018)
(AD-A147378; TR-10) Avail: NTIS HC A05/MF A01 CSCL 12/1

Ambiguity results from having limited knowledge of the process that generates outcomes. It is argued that many real-world processes are perceived to be ambigious; moreover, as Ellsberg demonstrated, this poses problems for theories of probability operationalized via choices amongst gambles. A descriptive model of how people make judgments under ambiguity is proposed. The model assumes an anchoring-and-adjustment process in which an initial estimate provides the anchor, and adjustments are made for what might be. The latter is modeled as the result of a mental simulation process where the size of the simulation is a function of the amount of ambiguity, and differential weighting of imagined probabilities reflects one's attitude toward ambiguity. A two-parameter model of this process is shown to be

consistent with: Ellsberg's original paradox, the non-additivity of complementary probabilities, current psycho-logical theories of risk, and Keynes' idea of the weight of evidence. The model is tested in four experiments involving both individual and group analyses. In experiments 1 and 2, the model is shown to predict judgments quite well; in experiment 3, the inference model is shown to predict choices between gambles; experiment 4 shows how buying and selling prices for insurance are systematically influenced by one's attitude toward ambiguity. GRA

N85-16573# Stanford Univ., Calif. Lab. for Computational Statistics.
GENERALIZED ADDITIVE MODELS
T. Hastie and R. J. Tibshirani Sep. 1984 42 p
(Contract N00014-83-K-0472)
(AD-A147454; LCS-TR-2) Avail: NTIS HC A03/MF A01 CSCL 12/1

Likelihood based regression models, such as the normal linear regression model and the linear logistic model, assume a linear (or some other parametric) form for the covariate effects. The authors introduce the Local Scoring procedure which is applicable to any likelihood-based regression model: the class of Generalized Linear Models contains many of these. In this class the Local Scoring procedure replaces a linear predictor by a additive predictor; hence the name Generalized Additive Models. Local Scoring can also be applied to non-standard models like Cox's proportional hazards model for survival data. GRA

N85-16574# Wisconsin Univ., Madison. Mathematics Research Center.
A FACTOR ANALYSIS FOR TIME SERIES Technical Summary Report
D. Pena and G. E. P. Box Jul. 1984 59 p
(Contract DAAG29-80-C-0041)
(AD-A147495; AD-F300490; MRC-TSR-2722) Avail: NTIS HC A04/MF A01 CSCL 12/1

This paper studies how to identify hidden factors in multivariate time series process. It is shown that the number of factors must be equal to the rank of both the covariance matrices and the parameter matrices of the infinite moving average representation of the process. A canonical transformation is derived which can recover such factors. The method is illustrated with several examples. GRA

N85-16575# Wisconsin Univ., Madison. Mathematics Research Center.
BELIEF STRUCTURES
Michael Goldstein Aug. 1984 25 p
(Contract DAAG29-80-C-0041)
(AD-A147526; MRC-TSR-2738) Avail: NTIS HC A02/MF A01 CSCL 12/1

A belief structure is an inner product space which expresses one's (probabilistic) beliefs about certain random quantities. This structure is a fundamental element of the subjectivist theory of probability. This report provides an essentially non-technical description of the basis of the construction, and the ways in which it differs from more familiar Bayesian constructions. Author (GRA)

N85-16576# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
THE EFFECT OF ASSUMPTIONS ABOUT COST ELEMENT PROBABILITY DISTRIBUTIONS ON OPERATING AND SUPPORT COST RISK ANALYSIS M.S. Thesis
D. B. Freeman Sep. 1984 93 p
(AD-A147553; AFIT/GLM/LSM/84S-24) Avail: NTIS HC A05/MF A01 CSCL 15/5

This thesis sought to determine the effects of assumptions about cost element probability distribution on Operating and Support cost estimates. Currently, these assumptions are being made arbitrarily, without regard for their effect on the risk associated with a total cost estimate. The experiment was performed with a Monte Carlo simulation. Three cost elements, (fuel costs, maintenance personnel costs, and depot maintenance costs) were used as the sample space. Historical data from 41 fighter aircraft was used to determine the low, high, and modal values of each cost element. The Triangular, Beta and Gamma distributions were selected as candidate distributions for the cost elements. The low, modal and high values provided a means by which to parameterize the distributions for specific cost elements. The distribution for each cost element was varied over the set of candidates with all other factors held constant, samples were drawn and then summed to provide total cost estimates. The result was an array of 18 total cost distributions containing 1000 data points each. The variance of the 18 resultant distributions was the focus of the analysis. That analysis indicated that the cost element distribution chosen does have an effect on the risk of the total cost estimate. Further, distributions with infinite upper bounds result in consistently higher risk than those with finite upper bounds. GRA

N85-16577# North Carolina Univ., Chapel Hill. Center for Stochastic Processes.
LIMITING DISTRIBUTIONS OF FUNCTIONALS OF MARKOV CHAINS
R. L. Karandikar and V. G. Kulkarni Aug. 1984 26 p
(Contract F49620-82-C-0009)
(AD-A147832; TR-74; AFOSR-84-0989TR) Avail: NTIS HC A03/MF A01 CSCL 12/1

This document considers several examples including that of a nonhomogeneous Poisson process with periodic rate function where the limiting distribution of the interevent times are obtained. GRA

N85-16578# North Carolina Univ., Chapel Hill. Dept. of Statistics.
LOCAL DEPENDENCE AND POINT PROCESSES OF EXCEEDANCES IN STATIONARY SEQUENCES
J. Husler Sep. 1984 19 p
(Contract F49620-82-C-0009)
(AD-A147859; TR-77; AFOSR-84-1054TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

The point processes of high level exceedances are investigated under a weak mixing condition restricting the long range dependence of the stationary sequence. Depending on the local dependence, the asymptotic properties of the clustering of the exceedances and the cluster size distribution are found. This is described by the convergence of the point process of high level exceedances to a compound Poisson process. GRA

N85-16579# Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
ROBUST PREDICTION AND INTERPOLATION FOR VECTOR STATIONARY PROCESSES, PART 3
H. Tsaknakis, D. Kazakos, and P. Papantoni-Kazakos Oct. 1984 26 p
(Grants AF-AFOSR-0229-83; AF-AFOSR-0030-82)
(AD-A147860; UCT/DEECS/TR-84-11; AFOSR-84-1059TR) Avail: NTIS HC A03/MF A01 CSCL 12/1

Robust multivariate prediction and interpolation problems for statistically contaminated vector valued second order stationary processes are considered. The statistical contamination is modeled by requiring that the spectra of the processes lie within certain non-parametric classes. Both prediction and interpolation are then formalized as games whose saddle point solutions are sought. Finally, such solutions are found and analyzed, for two specific multivariate spectral classes. Author (GRA)

N85-16580# North Carolina Univ., Chapel Hill. Dept. of Statistics.
INFINITE ORDER AUTOREGRESSIVE REPRESENTATIONS OF MULTIVARIATE STATIONARY STOCHASTIC PROCESSES
Mohsen Pourahmadi Sep. 1984 22 p
(Contract F49620-82-C-0009)
(AD-A147863; TR-75; AFOSR-84-0990TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

While it is well-known that every purely nondeterministic full

rank q- variate weakly stationary stochastic process (X sub n) with the spectral density W has an (infinite order) one-sided moving average representation, not every such process can have a mean convergent (infinite order) autoregressive representation (ARR) and the problem of ARR of such processes has not received the attention which it deserves. Due to the importance of ARR in prediction theory, and particularly in the statistical theory of multivariate time series, this paper is devoted to the problem of finding the weakest condition on W which guarantees the existence of an infinite order ARR for (X sub n). GRA

N85-16255*# Houston Univ., Tex. Dept. of Mathematics.
BAYESIAN ESTIMATION OF NORMAL MIXTURE PARAMETERS
Charles Peters *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 101-114 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16256*# Texas Univ., Austin. Center for Statistical Sciences.
SPATIAL ESTIMATION FROM REMOTELY SENSED DATA VIA EMPIRICAL BAYES MODELS
Joe R. Hill, David V. Hinkley, Hubert Kostal, and Carl N. Morris *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 115-135 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16258*# Texas A&M Univ., College Station.
AUTOREGRESSIVE SPECTRAL ESTIMATION FOR TWO DIMENSIONAL TIME SERIES
H. Joseph Newton and William B. Smith *In its* Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 165-174 refs ERTS (For primary document see N85-16251 07-43)
Avail: NTIS HC A25/MF A01 CSCL 12A

N85-16262*# Kansas Univ., Lawrence. Telecommunications and Information Sciences Lab.
POWER SPECTRAL ENSITY OF MARKOV TEXTURE FIELDS
K. Sam Shanmugan and J. C. Holtzman *In* Texas A and M Univ. Proc. of the 2nd Ann. Symp. on Math. Pattern Recognition and Image Analysis Program 1984 p 303-307 refs ERTS (For primary document see N85-16251 07-43)
(Contract NAS9-16664)
Avail: NTIS HC A25/MF A01 CSCL 12A

66 SYSTEMS ANALYSIS

Includes mathematical modeling; network analysis; and operations research.

No abstracts in this category.

67 THEORETICAL MATHEMATICS

Includes topology and number theory.

N85-16581# North Carolina Univ., Chapel Hill. Dept. of Statistics.
A NON-COMMUTATIVE QUASI SUBADDITIVE ERGODIC THEOREM
R. Jajte Aug. 1984 15 p
(Contract F49620-82-C-0009)
(AD-A146810; TR-73; AFOSR-84-0917TR) Avail: NTIS HC A02/MF A01 CSCL 12/1

This work is a contribution to the non-commutative pointwise ergodic theory which has been developed recently in a series of papers by a few authors. These authors extended to the von Neumann algebra context the classical Birkhoff's type theorems. This documents main goal is to prove a non-commutative version of a subadditive ergodic theorem. GRA

70 PHYSICS (GENERAL)

For geophysics see *46 Geophysics*. For astrophysics see *90 Astrophysics*. For solar physics see *92 Solar physics*.

N85-16582# Rockwell International Corp., Thousand Oaks, Calif. Microelectronics Research and Development Center.
RESEARCH ON ELECTROLUMINESCENCE IN THIN FILM YTTRIUM OXYSULFIDE Final Report, 1 Jun. 1981 - 15 Sep. 1983
R. D. Ketchpel and L. G. Hale Aug. 1984 54 p Prepared for AFOSR
(Contract F49620-81-C-0069)
(AD-A146909; MRDC41090.3FR; AFOSR-84-0891TR) Avail: NTIS HC A04/MF A01 CSCL 20/3

Thin films of a rare-earth oxysulfide phosphor, yttrium oxysulfide:europium, were evaluated for use in a thin film electroluminescent emitter (TFEL). For the first time, emission typical of the rare earth activator was observed in a rare earth host TFEL emitter. The films were characterized for optical spectrum, brightness-voltage characteristic, photoluminescence, crystal structure, and compared to efficient cathodoluminescent powder phosphors, yttrium oxysulfide:europium, as well as high efficiency TFEL emitters of zinc sulfide:manganese. The E-beam deposited films exhibited considerable photoluminescence and cathodoluminescence after a high temperature anneal (600 C). However, the anneal induced cracks in the phosphor film, which in turn limited the maximum applied voltage and electroluminescent brightness to less than 1 ft-L. Alternate substrate materials and process schedules minimized the cracking, but did not eliminate this fundamental problem. GRA

71 ACOUSTICS

Includes sound generation, transmission and attenuation. For noise pollution see *45 Environment Pollution*.

N85-16583 United Kingdom Atomic Energy Authority, Risley (England).
ULTRASONIC MEASUREMENTS, X-RAY PHOTOGRAPHS AND IMAGE PROCESSING
M. Delbos 5 Jul. 1984 9 p Transl. into ENGLISH of "Mesures ultrasoniques, radiographies et traitement d'images" conf. paper, 1981 7 p Presented at Intern. Colloq. on in situ Testing and Inspection of Irradiated and Inaccessible Components in Nuclear Plants, Paris, 26-27 Nov. 1981
(BLL-Risley-Tr-4586-(9091.9F)) Avail: British Library Lending Div., Boston Spa, Engl.

Image processing introduces a new resource to nondestructive inspection which is both qualitative and qunantitative. In addition, the balanced co-ordination which it brings about between computation and visualization offers the prospect of a cautious advance towards automation. B.G.

N85-16584 Department of the Navy, Washington, D. C.
LIGHTWEIGHT, BROADBAND RAYLEIGH WAVE TRANSDUCER Patent
M. B. Moffett, inventor (to Navy) Issued 31 Jul. 1984 7 p Supersedes AD-D010156
(AD-D011345; US-Patent-4,462,256; US-Patent-Appl-SN-453631; US-Patent-Class-73-642) Avail: US Patent and Trademark Office CSCL 17/1

A broadband angle-beam transducer system for producing

and/or receiving Rayleigh waves on the surface of a metal medium comprises a thickness mode piezoelectric polymer transducer element embedded within and impedance matched to a plastic wedge. The transducer element is oriented at an angle determined to be the critical angle for Rayleigh waves in the metal structure to be tested. As a transmitter, the transducer element generates discrete dilatational wave pulses, one of which propagates within the plastic wedge to the plastic face in contact with the metal structure. At this face some of the wave energy is reflected as dilatational and shear waves within the wedge and the remainder of the wave energy passes through a coupling medium into the metal structure producing a Rayleigh wave traveling along the surface of the structure. When the system is used as a receiver, a Rayleigh wave propagating on the surface of the metal structure is received by the polymer element which then generates a voltage proportional to the Rayleigh waveform. GRA

N85-16585 Department of the Navy, Washington, D. C.
SUPERLATTICE ULTRASONIC WAVE GENERATOR Patent
J. J. Quinn, U. Strom, and L. L. Chang, inventors (to Navy) Issued 4 Sep. 1984 9 p
(AD-D011363; US-Patent-4,469,977; US-Patent-Appl-SN-435156; US-Patent-Class-310-334) Avail: US Patent and Trademark Office CSCL 20/1

An ultrasonic wave generator comprising a semiconductor superlattice with a periodic variation in its space charge and a far infrared laser for applying a transient electric field to the superlattice transverse to the direction of its periodic variation is described. The ultrasonic wave produced has a wavelength of the period of the superlattice which can result in 100 gigahertz ultrasonic waves. Structure is included for guiding these waves into an acoustic system. Author (GRA)

N85-16586*# Old Dominion Univ., Norfolk, Va. Dept. of Electrical Engineering.
ULTRASOUND INSTRUMENTATION FOR THE 7 INCH MACH SEVEN TUNNEL Final Report, 28 Aug. - 31 Dec. 1984
David S. Mazel and Roland R. Mielke Jan. 1985 29 p refs
(Contract NAS1-17099)
(NASA-CR-174277; NAS 1.26:174277) Avail: NTIS HC A03/MF A01 CSCL 20A

The use of an Apple II+ microcomputer to collect data during the operation of the 7 inch Mach Seven Tunnel is discussed. A method by which the contamination of liquid oxygen is monitored with sound speed techniques is investigated. The electrical equivalent of a transducer bonded to a high pressure fill plug is studied. The three areas are briefly explained and data gathered for each area are presented. B.G.

N85-16587*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROACOUSTIC DATA FOR HIGH REYNOLDS NUMBER SUPERSONIC AXISYMMETRIC JETS
John M. Seiner and Michael K. Ponton (Kentron International, Inc., Hampton, Va.) Jan. 1985 70 p refs
(NASA-TM-86296; L-15846; NAS 1.15:86296) Avail: NTIS HC A04/MF A01 CSCL 20A

Both aerodynamic and near field acoustic behavior of several unheated axisymmetric shock free and shock containing high speed jet plumes are reported. The exit Mach number range for these data is from 0.9 to 2.5. The aerodynamic measurements include both mean and turbulence quantities for a shock free jet plume produced by a convergent divergent nozzle designed to have an exit Mach number of 2. The near field acoustic measurements presented include narrow band spectra, directivity and contour plots of select one third octave band data, and near field microphone correlations from a linear array. Shock noise results are also included as obtained by operating an underexpanded convergent nozzle at the design point of two supersonic exist Mach number convergent divergent nozzles. Author

N85-16588*# Bionetics Corp., Hampton, Va.
DETECTION OF LOW FREQUENCY IMPULSIVE NOISE FROM LARGE WIND TURBINE GENERATORS
Kevin P. Shepherd Jan. 1985 24 p refs
(Contract NAS1-16978)
(NASA-CR-172511; NAS 1.26:172511) Avail: NTIS HC A02/MF A01 CSCL 20A

The thresholds of detection of low frequency, impulsive wind turbine sounds in the presence of background noise were examined. Seven wind turbine sounds, six of which were synthesized, were used in conjunction with three background noise conditions; quiet, 35, and 45 dB(A). The results indicate that thresholds of detection are predictable based on assumed characteristics of the auditory system. The synthesized wind turbine sounds were found to adequately represent a real recording. Author

N85-16589*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
ON THE LONG RANGE PROPAGATION OF SOUND OVER IRREGULAR TERRAIN Final Report
M. S. Howe Dec. 1984 35 p refs
(NASA-CR-3862; L-5515; NAS 1.26:3862) Avail: NTIS HC A03/MF A01 CSCL 20A

The theory of sound propagation over randomly irregular, nominally plane terrain of finite impedance is discussed. The analysis is an extension of the theory of coherent scatter originally proposed by Biot for an irregular rigid surface. It combines Biot's approach, wherein the surface irregularities are modeled by a homogeneous distribution of hemispherical bosses, with more conventional analyses in which the ground is modeled as a smooth plane of finite impedance. At sufficiently low frequencies the interaction of the surface irregularities with the nearfield of a ground-based source leads to the production of surface waves, which are effective in penetrating the ground shadow zone predicted for a smooth surface of the same impedance. Author

N85-16590*# Aeronautical Research Associates of Princeton, Inc., N. J.
ANALYSIS OF THE SURFACE LOAD AND RADIATED SOUND OF A VIBRATING AIRFOIL WITH APPLICATION TO THE EXPERIMENT OF BROOKS Final Report
John E. Yates Washington NASA Jan. 1984 143 p refs
(Contract NAS1-17003)
(NASA-CR-3864; NAS 1.26:3864; ARAP-508) Avail: NTIS HC A07/MF A01 CSCL 20A

A method is developed for calculating the surface load and radiated sound from a vibrating surface in a compressible viscous fluid. The method is applied to a thin two-dimensional elliptic cross-section. For large values of the viscous diffusion parameter, the surface load tends to an elliptic distribution in agreement with the results of inviscid theory when edge pressure continuity is enforced. For thin surfaces, the surface load is insensitive to variations in the thickness ratio. A three-dimensional spectral technique is developed to calculate the inviscid surface load and radiated sound from a thin vibrating airfoil. The inviscid theory predicts the correct form of the far field sound pressure and its phase. The actual levels are somewhat sensitive to the choice of theoretical spanwise surface pressure mode but are in better agreement with the experiment than the surface pressure. The comparison of theoretical and experimental surface pressure indicates that the viscous theory, used to validate the inviscid theory, is either inadequate or there is a source of experimental error. R.S.F.

N85-16591# New York Univ., New York. Inst. of Mathematical Sciences.
OCEAN ACOUSTICS Final Technical Report
D. Stickler Oct. 1984 5 p
(Contract N00014-75-C-0218)
(AD-A147062) Avail: NTIS HC A02/MF A01 CSCL 20/1

The main element of this final report is a discussion of the development of the trace method for determining the acoustic properties of the ocean bottom sediments and basement. In

addition a method is reported for the uniform determination of the continuous modal contribution in a normal mode expansion for the second term in the geometrical acoustic expansion near a smooth caustic. GRA

N85-16592# Mississippi Univ., University. Physical Acoustics Research Lab.
STUDY OF OPTICAL SOUND GENERATION AND AMPLIFICATION Annual Report
H. E. Bass, L. A. Crum, and F. D. Shields 1 Nov. 1984 14 p
(Contract N00014-84-C-0193; RR0-1108)
(AD-A147359; AD-F300486; PARGUM-84-02) Avail: NTIS HC A02/MF A01 CSCL 20/1

This project involves four separate tasks with the following titles: (Task 1) Generation of low frequency sound from optical pulses, (Task 2) Propagation of sound through a gas with an over population of vibrationally excited states, (Task 3) Opto-acoustic studies in liquids, and (Task 4) Non linear oscillation of gas bubbles. The first three tasks funded by the physics division of ONR represent a three pronged study of the generation of sound by the absorption of light. The fourth task, funded by the mathematics division of ONR is a continuing study of cavitation in liquids. GRA

N85-16593# Federal Aviation Administration, Washington, D.C. Office of Environment and Energy.
HELICOPTER NOISE SURVEY PERFORMED AT LAS VEGAS, NEVADA, 19-21 JANUARY, 1984
S. R. Albersheim 1984 49 p
(AD-A147392; FAA/EE-84-15) Avail: NTIS HC A03/MF A01 CSCL 20/1

The FAA conducted a noise measurement survey of helicopter operations at Las Vegas during the Annual Helicopter Association International Convention. The survey was performed during the period of January 19-21, 1984. The purpose of this noise survey was to obtain additional noise data for a number of different helicopter models during normal operations in an urban environment. This survey was the first test program which measured sideline noise levels beyond 500 feet. The data collected are classified as survey type data, since the data obtained were from target of opportunity as apposed to controlled test data. GRA

N85-16594# Lamont-Doherty Geological Observatory, Palisades, N. Y.
ARCTIC MARINE ACOUSTICS Final Report, 1 Oct. 1979 - 30 Sep. 1983
H. W. Kutschale Oct. 1984 234 p
(Contract N00014-80-C-0021)
(AD-A147492; AD-F300490; LDGO0S-20081) Avail: NTIS HC A11/MF A01 CSCL 20/1

Wave-theoretical computer codes have been developed to model pulse propagation in the central Arctic Ocean. Pulse shapes as a function of range and depth are computed from the Pulse Fast Field Program (PFFP) and the pulse parabolic equation (PPE) code. Group- and phase-velocity dispersion and eigenfunctions are computed from the PFFP or from a corresponding normal-mode program. Good agreement has been obtained between measured and computed SOFAR signals. The effect of ice roughness on Arctic SOFAR propagation is illustrated from field data and the PFFP. Hydroacoustic signals from underwater explosions that have propagated over the Arctic abyssal plains commonly display marked frequency dispersion in pulses that are bottom-interacting and that arrive after the SOFAR signal. In the infrasonic band of 2 to 20 Hz, the temporal dispersion for each pulse that has interacted with the flat bottom of the plain can be nearly as strong as that observed in the SOFAR signal for the first mode. However, the bottom-interacting pulses correspond to a coherent summation of many higher-order normal modes in a channel bounded above by the ocean surface and below by the zone of increasing velocity in the upper 400 m of the bottom sediment. GRA

N85-16595# Federal Aviation Administration, Washington, D.C. Office of Environment and Energy.
NOISE MEASUREMENT FLIGHT TEST: DATA-ANALYSES AEROSPATIALE AS-355F TWINSTAR HELICOPTER
J. S. Newman, E. J. Rickley, K. R. Beattie, and T. L. Bland Aug. 1984 101 p
(AD-A147497; AD-F300490; DOT/FAA/EE-84-04) Avail: NTIS HC A06/MF A01 CSCL 20/1

This report documents the results of a Federal Aviation Administration (FAA) noise measurement flight test program with the TwinStar twin-jet helicopter. The report contains documentary sections describing the acoustical characteristics of the subject helicopter and provides analyses and discussions addressing topics ranging from acoustical propagation to environmental impact of helicopter noise. This test program was designed to address a series of objectives including: (1) acquisition of acoustical data for use in assessing heliport environmental impact, (2) documentation of directivity characteristics for static operation of helicopters, (3) establishment of ground-to-ground and air-to-ground acoustical propagation relationships for helicopters, (4) determination of noise event duration influences on energy dose acoustical metrics, (5) examination of the differences between noise measured by a surface mounted microphone and a microphone mounted at a height of four feet (1.2 meters), and (6) documentation of noise levels acquired using international helicopter noise certification test procedures. GRA

N85-16596# Department of the Army, Washington, D. C.
MICROWAVE RESONATOR USING LATERAL EXCITATION Patent Application
A. Ballato, inventor (to Army) Filed 24 Oct. 1984 16 p
(AD-D011374; US-Patent-Appl-SN-664267) Avail: NTIS HC A02/MF A01 CSCL 20/1

An improvement in piezoelectric crystal resonators using lateral excitation whereby energy of vibration trapped in a region between the electrodes is provided by the inclusion of recessed electrodes adjacent a relatively raised piezoelectric region on at least one major face of surface of the crystal. The recessed electrodes oppose one another in either a horizontal or a vertical direction to generate a lateral field in the body of the crystal upon excitation. Additionally, curved edge interfaces are provided between the recessed electrodes and the piezoelectric crystal material to reduce field gradients. Tapered electrodes which have the effect of increasing the energy trapping in the gap between the electrodes are also disclosed. Author (GRA)

N85-16597# Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Mathematical Sciences.
CURRENT AND CURRENT SHEAR EFFECTS IN THE PARABOLIC APPROXIMATION FOR UNDERWATER SOUND CHANNELS
W. L. Siegmann, M. J. Jacobson, and J. S. Robertson 30 Sep. 1984 52 p
(Contract N00014-76-C-0288)
(AD-A147833; RPI-MATH-144) Avail: NTIS HC A04/MF A01 CSCL 20/1

The effect of currents on the acoustic pressure field in an underwater sound channel is investigated. Based on fundamental fluid equations, model equations are formulated for sound pressure while including nonuniform currents in the source-receiver plane. Application of parabolic-type approximations yields a collection of parabolic equations. Each of these is valid in a different domain determined by the magnitudes of current speed, current shear, and depth variation of sound speed. Under certain conditions, it is possible to interpret current effects in terms of an effective sound speed. Using this effective sound speed in an existing numerical code, we examined sound speed in a shallow water isospeed channel with a simple shear flow and a lossy bottom. It is found even small currents can induce very substantial variations in relative intensity. The degree of variation depends upon current speed, source and receiver geometry, and acoustic frequency. Particular emphasis is placed on intensity difference predictions in reciprocal sound transmissions in the presence of an ocean current. GRA

N85-16598# Oak Ridge Y-12 Plant, Tenn.
USE OF THE ANALYTIC SIGNAL IN ULTRASONIC IMAGING
Zane W. Bell 24 Aug. 1984 8 p refs Presented at the Rev. of Progr. in Quantitative NDE, La Jolla, Calif., 8-13 Jul. 1984
(Contract DE-AC05-84OS-21400)
(DE84-016843; Y/DW-481; CONF-840738-5) Avail: NTIS HC A02/MF A01

A software and a hardware implementation of the analytic signal, in which a single sideband signal is generated is presented. The reconstruction algorithm and the accuracy of reconstruction are discussed. Two problem areas are identified: depth resolution and the merging of images from several transducers. DOE

72 ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

N85-16599 British Library Lending Div., Boston Spa (England).
CALCULATION OF ENERGY OF ATOMIZATION IN SILICATE TETRAHEDRON Si4(4-)
S. P. Kurlov, B. M. Lepinskikh, and O. I. Bukhtoyarov 1984 8 p refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Chern. Met. (USSR), 1984 no. 5 p 1-3
(BLL-M-36000-(5828.4)) Avail: British Library Lending Div., Boston Spa, Engl.

The energy of particle interaction was examined by the method of superposition integrals in the elementary silicate anion SiOh4(-4). The Milliken formula, which breaks down the complete energy of atomization into individual contributions, was used in calculation. The three main contributions to the energy of atomization are the energy of interaction of valency electrons, the repulsion energy between non-bonding pairs of electrons in each atom, and the energy of the ionic fraction of the bond. Author

N85-16600# Royal Aircraft Establishment, Farnborough (England).
CALCULATED PARAMETERS FOR THE INITIAL PART OF AN ACCELERATOR WITH HIGH-FREQUENCY QUADRUPOLE FOCUSING
A. P. Maltsev, V. B. Stepanov, and V. A. Teplyakov Feb. 1984 28 p refs Transl. into ENGLISH from Inst. Fiz. Vysokikh Energii Inzh (USSR), v. 39, no. 2, 1971 p 1-30
(RAE-Trans-2122; BR93463) Avail: NTIS HC A03/MF A01

The Radio Frequency Quadrupole accelerator (RFQ) offers high capture efficiency for low energy ions. While accelerating ions to a few MeV, compression is achieved for longitudinal motion (bunching) and radial motion (focusing) without the use of magnetic lenses. Specially shaped electrodes produce transverse electric field components with quadrupolar symmetry. The design of the low energy section of linear accelerators is facilitated and thereby the evolution of high beam current machines. Design criteria for the electrical and mechanical aspects of the low energy accelerator are derived from a theoretical treatment of particle motion through the machine, including an appreciation of constructional tolerances on both longitudinal and radial motion. Finally, the choice of parameters for the design is examined and the use of the graphical and tabulated data explained. B.G.

N85-16601*# Howard Univ., Washington, D. C. Dept. of Physics.
THE 13C NUCLEAR MAGNETIC RESONANCE IN GRAPHITE INTERCALATION COMPOUNDS
T. Tsang and H. A. Resing [1985] 15 p refs Sponsored by NASA Prepared in cooperation with NRL, Washington, D.C.
(NASA-CR-174261; NAS 1.26:174261) Avail: NTIS HC A02/MF A01 CSCL 20H

The (13)C NMR chemical shifts of graphite intercalation compounds were calculated. For acceptor types, the shifts come mainly from the paramagnetic (Ramsey) intra-atomic terms. They are related to the gross features of the two-dimensional band structures. The calculated anisotropy is about -140 ppm and is independent of the finer details such as charge transfer. For donor types, the carbon 2p pi orbitals are spin-polarized because of mixing with metal conduction electrons, thus there is an additional dipolar contribution which may be correlated with the electronic specific heat. The general agreement with experimental data is satisfactory. M.G.

N85-16602# New York Univ., New York. Dept. of Physics.
THEORETICAL STUDIES RELATING TO THE INTERACTION OF RADIATION WITH MATTER: ATOMIC COLLISION PROCESSES OCCURRING IN THE PRESENCE OF RADIATION FIELDS Annual Report, 1 Aug. 1983 - 31 Jul. 1984
P. R. Berman 15 Sep. 1984 130 p
(Contract N00014-77-C-0553)
(AD-A146854; AR-7) Avail: NTIS HC A07/MF A01 CSCL 20/8

Research has been carried out in the areas of: Creation of electronic state coherence in laser assisted collisions, Collision-induced structure in pump-probe and 4-wave mixing spectroscopy, Two-level atom plus radiation pulse, Propagation effects in pump-probe and Raman spectroscopy, and Photon echoes in dressed atoms. Author (GRA)

N85-16603# Massachusetts Inst. of Tech., Cambridge.
FORCES ON NEUTRAL ATOMS DUE TO ELECTROMAGNETIC FIELDS Annual Summary Report, 1 Sep. 1983 - 31 Aug. 1984
D. E. Pritchard 19 Oct. 1984 15 p
(Contract N00014-83-K-0695)
(AD-A146984) Avail: NTIS HC A02/MF A01 CSCL 07/4

Plans for an apparatus to trap neutral atoms using conventional wire-wound magnets are described in our publication Apparatus for Trapping Neutral Atoms. We have now gotten a sodium beam in this apparatus and are performing laser diagnostics to enable us to understand the slowing process. We hope to observe stopped atoms in a few months; then we shall look for trapped atoms. When our DOD equipment grant arrives, we will begin construction of a trap based on superconducting technology. This will enable us to begin the research mentioned in our publication What to Do with Trapped Atoms. GRA

N85-16604# Department of the Navy, Washington, D. C.
A LOW PERTURBATION ELECTRON INJECTOR FOR CYCLIC ACCELERATORS Patent Application
F. Mako, W. Manheimer, C. A. Kapetanokos, and F. Sandel, inventors (to Navy) Filed 14 Jun. 1984 24 p
(AD-D011312; US-Patent-Appl-SN-620646) Avail: NTIS HC A02/MF A01 CSCL 20/7

This invention relates to transporting electron beams without disturbance, and more particularly to a means of transporting an electron beam across magnetic field lines without adding much perpendicular velocity to the electrons. Discussed is a tapered z-pinch for externally introducing an electron beam into a particle accelerator that causes only a small development of perpendicular velocity in the electrons of the electron beam, and that causes only a small disturbance to the magnetic field lines of the particle accelerator. GRA

N85-16605# University of South Florida, Tampa.
CONFERENCE ON SINGLET MOLECULAR OXYGEN (COSMO 84), PROGRAM AND ABSTRACTS Final Report
B. Stevens 24 Sep. 1984 93 p Conf. held at Clearwater Beach, Fla., 4-7 Jan. 1984
(Contract N00014-84-C-0032)
(AD-A147281; Rept-18-2705-124F) Avail: NTIS HC A05/MF A01 CSCL 07/2

The Conference objective was to promote interdisciplinary awareness and communication by assembling research workers in such diverse fields as photochemistry, photophysics, synthetic chemistry, photobiology, photomedicine, laser and atmospheric physics; and to present their recent findings with singlet molecular oxygen as the common theme. This was prompted by several recent developments: notably the direct observation of 02 superscript 1 micron g in emission at 1.27 microns which now provides solvent-dependent life-times, reaction or quenching rate constants, and sensitized yields directly; the trapping of zwitterionic

intermediates and the role of catalysts in electron transfer peroxidation; the feasibility of a singlet oxygen-iodine chemical laser; direct observation of 02 microns g in enzymic processes; the use of endoperoxides as actinometers; the phototherapy of malignant tumors; prospects for 02 superscript 1 delta g as a solar energy storage intermediate. GRA

N85-16606# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
PION INELASTIC SCATTERING TO THE FIRST THREE EXCITED STATES OF LITHIUM-6 Ph.D. Thesis
R. R. Kiziah Dec. 1984 189 p
(AD-A147560; AFIT/CI/NR-84-85D) Avail: NTIS HC A09/MF A01 CSCL 20/8

Using the Energetic Pion Channel and Spectrometer system at the Clinton P. Anderseon Meson Physics Facility, differential cross sections were measured for pi(+) inelastic scattering to the 3(+), T=0, 2.185-Mev, 0(+), T=1, 3.563-MeV, and 2(+), T=0, 4.25-MeV states of Li at incident pion energies of 120 and 180 MeV and laboratory scattering angles between 15 deg and 47 deg. Excitation functions were measured at a constant momentum transfer of approximately 109 MeV/c for incident pion energies from 100 to 260 MeV. The constant momentum transfer corresponds to the maxima of the angular distributions for pi(+) inelastic scattering to the 3.563-MeV level. Microscopic calculations using the distorted-wave impulse approximation (DWIA) agree well with the measured angular distributions and excitations functions for the 2.185-and 4.25-MeV levels. GRA

N85-16607# Wisconsin Univ., Madison. Dept. of Physics.
INFRARED EMISSION AND ATOMIC TRANSITIONS Annual Technical Report, 1 Aug. 1983 - 31 Sep. 1984
C. C. Lin 24 Aug. 1984 4 p
(Grant AF-AFOSR-0312-83)
(AD-A147840; AFOSR-84-0985TR) Avail: NTIS HC A02/MF A01 CSCL 20/8

The general objectives of this research project is to study radiative transitions in atoms and molecules especially those relevant to infrared radiation. For the 8/83 - 7/84 period our major efforts inclued: (1) electron-impact excitation of low-Rydberg states of nitrogen; (2) production of excited oxygen atoms by electron-impact dissociation of oxygen; (3) a new method for measuring metastable atom number density; and (4) collision behaviors of Na atoms. GRA

N85-16608# Oak Ridge National Lab., Tenn.
CHAOS NEAR THE COULOMB BARRIER: NUCLEAR MOLECULES
M. R. Strayer 1984 23 p refs Presented at the Intern. Conf. on Fusion Reactions Below the Coulomb Barrier, Cambridge, Mass., 13-15 Jun. 1984
(Contract DE-AC05-84OR-21400)
(DE85-001280; CONF-8406156-4) Avail: NTIS HC A02/MF A01

The classical behavior of the alpha + (14)C and the (12)C + (12)C(0(+)) collison at energies near the Coulomb barrier is examined. The long-time motion of the compound nuclear system is identified in terms of its classical quasiperiodic and chaotic behavior. The consequences of this motion are discussed and interpreted in terms of the evolution of the system along a dynamical energy surface. DOE

N85-16609# Oak Ridge National Lab., Tenn.
COMMENTS ON THE IMAGE CONTRAST FROM INELASTICALLY SCATTERED ELECTRONS
S. J. Pennycock Jul. 1984 5 p Presented at Warner-Brandt Workshop on Penetration Phenomena: Inelastic Near-Surface Interaction, Oak Ridge, Tenn., 12 Apr. 1984 Submitted for publication
(Contract DE-AC05-84OR-21400)
(DE85-000899; CONF-8404190-3) Avail: NTIS HC A02/MF A01

There is considerable interest in forming images from inelastically scattered electrons, both for studying the scattering process itself, and to obtain information on surface structure and composition. Inelastic surface excitations are prominent features of the energy loss spectrum for reflection off bulk surfaces at grazing angles, or in aloof geometry from surfaces of small particles. Details of obtaining and using such images are discussed. DOE

N85-16610# Oak Ridge National Lab., Tenn.
ELECTRON SPECTROMETRY EXPERIMENTS WITH THE USE OF SYNCHROTRON RADIATION
Manfred O. Krause 1984 18 p refs Presented at the 9th Intern. Conf. on Atomic Phys., Seattle, 23 Jul. 1984
(Contract DE-AC05-84OR-21400)
(DE85-001286; CONF-840786-3) Avail: NTIS HC A02/MF A01

A survey of selected experiments is given to illustrate the advances made in the study of the electronic structure and dynamics of free atoms. Autoionization resonances, resonances in open-shell atoms, and atomic effects in free molecules are discussed. DOE

73 NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.

For space radiation see *93 Space Radiation.*

N85-16611*# Texas A&M Univ., College Station. Nuclear Engineering Div.
LUNAR NUCLEAR POWER FEASIBILITY STUDY Final Report
C. A. Erdman and Tam Tran Nov. 1984 42 p refs
(Contract NAS9-17141)
(NASA-CR-171831; NAS 1.26:171831) Avail: NTIS HC A03/MF A01 CSCL 18I

Based on review of literature and on limited examination of nuclear power systems now proposed for space applications, a nuclear fission reactor powered system should be seriously considered as the first large (order of 50 kWe or greater) power system to be placed on a lunar base. With relatively minor modifications, the major one being addition of a cooled side shield, the proposed 100 kWe product of the SP-100 Program could be adapted for use on a lunar base. B.G.

N85-16612# Air Force Weapons Lab., Kirtland AFB, N. Mex.
SNAP (SPACE NUCLEAR AUXILIARY POWER) REACTOR OVERVIEW Final Report, Jun. 1982 - Dec. 1983
S. S. Voss Aug. 1984 102 p
(AF Proj. 5797)
(AD-A146831; AFWL-TN-84-14) Avail: NTIS HC A06/MF A01 CSCL 18/14

The SNAP reactor programs are outlined in this report. A summary of the program is included along with a technical outline of the SER, S2DR, SNAP 10A/SNAPSHOT, S8ER, and S8DR reactor systems. Specifications of the designs, the design logic and a conclusion outlining some of the program weaknesses are given. Author (GRA)

N85-16613# Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H., Vienna. Inst. fuer Reaktorsicherheit.
AUSTRIAN CONTRIBUTIONS TO FUEL ROD FAILURE MODELS SHOWN AT THE INTERNATIONAL STANDARD PROBLEM (ISP)-14
Gert Sdouz Apr. 1984 57 p refs In GERMAN; ENGLISH summary Presented at Conf., Austria, 2 Apr. 1984
(OEFZS-4276; RS-238/84) Avail: NTIS HC A04/MF A01

The computer code BALON-2A was improved to perform the International Standard Problem ISP-14. The main extensions are the implementation of input-options and the development of a model to predict the pressure in the fuel rod gap. With these improvements and calculations for input values satisfactory results are obtained. Author (ESA)

N85-16614# Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H., Vienna. Inst. fuer Reaktorsicherheit.

THE REACTOR DYNAMIC CODE RETRANS: STRUCTURE AND USERS GUIDE
Gerald Kamelander, Franz Woloch, Gerd Sdouz, and Heinz Koinig Aug. 1984 61 p refs In GERMAN; ENGLISH summary Sponsored by Foerderung der Wissenschaftlichen Forschung
(OEFZS-4287; RS-242/84) Avail: NTIS HC A04/MF A01

The subroutine and COMMON blocks of the reactor dynamic computer program RETRANS are described to facilitate code modification and improvements of physical models and numerical methods. A user's guide is given as well as test examples. The physical meaning of the results is discussed. Author (ESA)

N85-16615# Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H., Vienna. Inst. fuer Chemie.
INQUIRY INTO DISINTEGRATION CONTROL OF IRRADIATED LOW ENRICHMENT URANIUM FOR HIGH TEMPERATURE GAS COOLED REACTORS [UNTERSUCHUNGEN ZUM AUFLOESUNGSVERHALTEN VON BESTRAHLTEM HTR-LEU-BRENNSTOFF]
Gerhard Reitsamer (Kernforschungsanlage, Juelich, West Germany), Gerhard Stolba, Gerhard Falta, Anton Strigl, Johann Zeger, and Vladimir Maly Jul. 1984 24 p refs In GERMAN; ENGLISH summary Submitted for publication Sponsored by Bundesministerium fuer Forschung und Technologie and Land NRLO
(OEFZS-7281; CH-334/84) Avail: NTIS HC A02/MF A01

The PyC-coatings of irradiated high temperature reactor (HTR) fuel particles from AVR fuel elements were burnt off by air and oxygen at 1120K (comparable to the current HTR head-end). Experiments on the solubility of this low enrichment uranium fuel prove that 99.93% of the uranium and 99.84% of the plutonium can be dissolved by 7n HNO3. After additional treatment with 7n HNO3/0.01 n NaF, only 0.01% of the original amount of uranium and 0.01% of the original amount of plutonium remain undissolved. Neither the insoluble residues nor the very small amounts of solids formed on standing (before and after concentrating the solution up to 200 g U/1 and acidity of 3 n HNO3) show any enrichment of plutonium compared with the nitric acid solution. Results indicate that LWR-PUREX-technology can be used for reprocessing HTR-LEU-fuel. Author (ESA)

74 OPTICS

Includes light phenomena.

N85-16616 Department of the Navy, Washington, D. C.
OPTICAL RF DOWNCONVERTER Patent
A. Spezio, inventor (to Navy) Issued 28 Aug. 1984 10 p Supersedes AD-D010142
(AD-D011336; US-Patent-4,468,766; US-Patent-Appl-SN-431981; US-Patent-Class-370-3) Avail: US Patent and Trademark Office CSCL 20/6

This invention relates generally to frequency conversion devices, and more particularly, to devices having extremely wide band widths for converting to and from optical wavelengths. GRA

N85-16617 Department of the Air Force, Washington, D.C.
ELECTRO-OPTICAL TARGET DETECTION Patent
H. Graff and J. D. Joseph, inventors (to Air Force) Issued 14 Aug. 1984 5 p
(AD-D011366; US-Patent-4,465,940; US-Patent-Appl-SN-368787; US-Patent-Class-250-578) Avail: US Patent and Trademark Office CSCL 17/5

An apparatus directed to a signal processing circuit for combining data from several spectral bands to enhance the signal-to-background ratio of a target detection system is discussed. Two spectral bands, with separate sensing arrays, receive analog signals which are fed to separate multiplexer units. From the multiplexers, the analog signals are applied to a comparator where they are compared with each other and also separately applied to shift registers where the signals are retained for further processing. If, during comparison, the ratio of the two bands is less than a threshold, there is an absence of cloud return and the signals stored in both shift registers are combined in a final output register. If the ratio of the two bands is more than a threshold, the band having the most cloud return is not used and the shift register containing the greater percentage of target return is processed through the output register. GRA

N85-16618 Department of the Air Force, Washington, D.C.
UNSTABLE OPTICAL RESONATOR WITH CANCELLING EDGE WAVES Patent
T. C. Salvi, M. E. Smithers, and G. C. Dente, inventors (to Air Force) Issued 16 Oct. 1984 12 p Supersedes AD-D009425
(AD-D011379; US-Patent-4,477,909; US-Patent-Appl-SN-353981; US-Patent-Class-372-95) Avail: US Patent and Trademark Office CSCL 20/6

A structural improvement to the feedback (i.e., output) mirror of an unstable optical resonator is described. The improvement may comprise either a step-like projection (either convex or concave) on the internal surface of the feedback mirror, or a change in curvature of the internal surface of the mirror. Each of these improvements actually constitutes a discontinuity in the internal surface of the mirror, with the curvature of the mirror on either side (i.e., around) the improvement remaining the same. The improvement cancels the interfering edge waves at the geometric source point of the resonator, thereby minimizing the effect of edge diffraction, and results in yielding more geometric modes having relatively uniform intensity profiles and large differences in feedback ratios between the dominant and higher-order modes. Author (GRA)

N85-16619 Department of the Air Force, Washington, D.C.
MIRROR ACTUATOR CONTROL SYSTEM Patent
N. S. Goralnick and G. H. McLellan, Jr., inventors (to Air Force) Issued 21 Aug. 1984 7 p Supersedes AD-D009333
(AD-D011383; US-Patent-4,467,186; US-Patent-Appl-SN-343041; US-Patent-Class-250-201) Avail: US Patent and Trademark Office CSCL 17/8

A mirror actuator control system utilizes a wavefront sensor to determine the resulting angle error signal between the wavefront tilt angle and the mirror tilt angle. The resulting angle error signal is used to drive the actuator unit which controls the mirror tilt angle. GRA

N85-16620 Department of the Air Force, Washington, D.C.
REDUCTION OF SIGNAL MODULATION CAUSED BY POLARIZATION IN VISIBLE OPTICAL SCANNING SYSTEMS Patent
M. R. Comer, inventor (to Air Force) Issued 16 Oct. 1984 7 p Supersedes AD-D009635
(AD-D011389; US-Patent-4,477,152; US-Patent-Appl-SN-382068; US-Patent-Class-350-394) Avail: US Patent and Trademark Office CSCL 17/8

A method and an apparatus for minimizing the polarization modulation effect of an optical scanner system which is in Earth orbit and is scanning the Earth are described. The optical train of the scanner includes a plurality of optically aligned, rotatable, flat folding mirrors having incident angle normals in the same plane, with the mirrors serially reflecting an image acquired by the scanning of the system in orbit. The method includes the steps of rotating the most rearwardly disposed of the mirrors around its vertical geometric axis such that the reflecting surface of the mirror is perpendicular to the impinging image beam, and then rotating the mirror around its horizontal geometric axis such that the angle of incidence of the impinging image beam is of a preselected magnitude. This change in positioned relationship results in a novel apparatus which minimizes the aforesaid polarization modulation effect. Author (GRA)

N85-16621*# Stanford Univ., Calif. Center for Space Science and Astrophysics.
THE EVALUATION OF A DEFORMABLE DIFFRACTION GRATING FOR A STIGMATIC EUV SPECTROHELIOMETER Progress Report, 15 Aug. - 30 Nov. 1984
J. Gethyn Timothy 30 Nov. 1984 10 p refs

(Grant NAGw-540)
(NASA-CR-174248; NAS 1.26:174248) Avail: NTIS HC A02/MF A01 CSCL 20F

A second toroidal replica grating was found to have an aspect ratio within 10% of the desire value. The aspect ratio of replica toroidal gratings is coming out somewhat low. Whether this is caused by some relaxation in the epoxy or some residual error in the setup when the replication is made from the deformable submaster grating will be determined. The first imaging tests at EUV wavelengths near 500 A were carried out. The initial results are most encouraging with blur sizes of the order of, or less than, 40 microns. Further focussing and additional photographic tests will be carried out, and preparations made for the first photoelectric measurements of the image quality using the (256 x 1024)-pixel MAMA detection system. The visible-light (256 x 1024)-pixel MAMA detector tube has completed initial evaluation. B.G.

N85-16622*# Stanford Univ., Calif. Center for Space Science and Astrophysics.
THE DEVELOPMENT AND TEST OF ULTRA-LARGE-FORMAT MULTI-ANODE MICROCHANNEL ARRAY DETECTOR SYSTEMS Progress Report, 1 Jun. - 30 Nov. 1984
J. G. Timothy 30 Nov. 1984 25 p refs
(Grant NAGw-551)
(NASA-CR-174247; NAS 1.26:174247) Avail: NTIS HC A02/MF A01 CSCL 20F

The specific tasks that were accomplished with each of the key elements of the multi-anode microchannel array detector system are described. The modes of operation of position-sensitive electronic readout systems for use with high-gain microchannel plates are described and their performance characteristics compared and contrasted. Multi-anode microchannel array detector systems with formats as large as 256 x 1024 pixels are currently under evaluation. Preliminary performance data for sealed ultraviolet and visible-light detector tubes show that the detector systems have unique characteristics which make them complementary to photoconductive array detectors, such as CCDs, and superior to alternative pulse-counting detector systems employing high-gain MCPs. R.S.F.

N85-16623# Hughes Research Labs., Malibu, Calif.
NONLINEAR OPTICAL STUDIES OF RYDBERG ATOMS USING DEGENERATE FOUR-WAVE MIXING Final Report, Mar. 1981 - Aug. 1984
J. F. Lam, R. A. McFarlane, and D. G. Steel Aug. 1984 126 p
(Contract DAAG29-81-C-0008)
(AD-A146827; ARO-17432.13-PH) Avail: NTIS HC A07/MF A01 CSCL 20/6

The spectral behavior of the third order nonlinear optical response of atomic sodium was studied. As a result, new kinds of frequency domain spectroscopy techniques were developed: nearly degenerate four-wave mixing, polarization nearly degenerate four-wave mixing, frequency domain three-state spectroscopy, and nonlinear Hanle effect in degenerate four-wave mixing. These techniques have provided new information on several areas of collision physics including: dephasing collisions (spectral broadening and frequency shift), velocity changing collisions, state changing collisions, and spin-flip collisions. Author (GRA)

N85-16624# Chemical Research and Development Center, Aberdeen Proving Ground, Md.
EFFECT OF INTEGRATION TIME ON PRECISION OF ABSORBANCES MEASURED WITH A DIODE ARRAY UV-VIS SPECTROPHOTOMETER Technical Report
J. W. Hovanec, R. P. Seiders, and J. R. Ward May 1984 38 p
(AD-A146952; CRDC-TR-84083) Avail: NTIS HC A03/MF A01 CSCL 20/6

Modern UV-VIS spectrophotometers such as the HP8450A equipped with a diode array controlled by a minicomputer can scan a spectrum from 200 to 800 nm in one second, or the instrument can time-average scans over a period of time denoted the integration time. In order to see whether the precision was significantly enhanced by time-averaging, replicate measurements were made with holmium oxide, and a dyestuff with peak absorbance near unity, as well as a diluted sample of the dye with peak absorbance near 0.01 absorbance unit. Measurements were made at 1-, 2-, 5-, 10-, 20-, and 40-second integration times. Bartlett's chi-squared statistic was used to test whether the variances were significantly different. The results showed that the variances were independent of integration time for all samples tested. The sample standard deviation was 0.001 absorbance unit for samples with peak absorbances near 1.0. For the diluted dye, the sample standard deviation was 2 x 10 to the minus 4th power absorbance unit. GRA

N85-16625# Hughes Research Labs., Malibu, Calif.
MULTIWAVELENGTH BIDIRECTIONAL COUPLER-DECOUPLERS Interim Report, 1 May 1983 - 29 Feb. 1984
J. Myer and H. W. Yen Mar. 1984 39 p
(Contract DAAB07-82-C-J071; DA Proj. 1L1-62701-AH-92)
(AD-A147009; CECOM-82-J071-3; IR-3) Avail: NTIS HC A03/MF A01 CSCL 20/6

This is an exploratory program to develop, fabricate and test a family of active and passive, single and two-fiber, fiber optic multiwavelength, bidirectional, coupler-decoupler modules. The goal of the contract is to have each member of the coupler-decoupler (multiplexer-demultiplexer) family be capable of coupling energy into, and decoupling energy out of, a single optical transmission line using a minimum of four wavelengths for the simultaneous full duplex transmission of a minimum of four optical channels. The coupler-decoupler will be designed for low throughput loss (<5 dB per channel, per single pass) and minimum crosstalk (no more than -35 dB of the received optical signal). The modules fabricated during the program will be evaluated for their ability to meet military environmental requirements, particularly with respect to temperature. The approach uses the miniature planar Rowland spectrometer configuration recently developed at Hughes Research Laboratories (HRL) for NASA as the basic building block for constructing the coupler-decoupler required for this program, eliminating the need for collimating optics, prisms, or thin-film filters. GRA

N85-16626# Geo-Centers, Inc., Newton, Mass.
ION MICROSCOPY OF METALS AND SEMICONDUCTORS
Aug. 1984 15 p
(Contract N00014-83-C-2183)
(AD-A147118; GC-TR-84-386) Avail: NTIS HC A02/MF A01 CSCL 20/6

During the last year several major changes have been instituted to improve the performance of CAMECA IMS-300 ion microscope system at the Naval Research Laboratory. The computer system dedicated to the instrument has been replaced, and new maintenance procedures have reduced electronic and vacuum problems associated with the instrument. Because of this, the overall reliability of the system has been improved, and the total turn around time necessary for SIMS analyses has been reduced. The utilization of the ion microscope for collaborative scientific research at NRL has been greatly improved. GRA

N85-16627# Department of the Navy, Washington, D. C.
OPTICAL FIBERS WITH REDUCED PRESSURE SENSITIVITY TO HIGH FREQUENCY ACOUSTIC FIELD Patent Application
N. Lagakos, J. H. Cole, and J. A. Bucaro, inventors (to Navy) Filed 30 Jul. 1984 14 p
(AD-D011306; US-Patent-Appl-SN-635693) Avail: NTIS HC A02/MF A01 CSCL 20/6

One object of this invention is to provide a novel optical fiber with reduced phased sensitivity to high frequency (e.g., ultrasonic) acoustic fields. These results can be accomplished by concentrically surrounding an optical fiber with a coating of low bulk modulus which in turn is surrounded by a high bulk modulus material. Such a composition minimizes the fiber phase sensitivity to radial trains which are generated by high frequency acoustic fields. GRA

N85-16628# Department of the Navy, Washington, D. C.
AN AUTOMATIC PATTERN RECOGNITION APPARATUS Patent

Application
W. J. King, inventor (to Navy) Filed 5 Jul. 1984 16 p
(AD-D011319; US-Patent-Appl-SN-627939) Avail: NTIS HC A02/MF A01 CSCL 20/6

This invention relates to a display correlator system, but more particularly, it relates to a multipurpose automatic pattern recognition apparatus that makes use of both optical templation and signal correlation techniques. By using liquid crystal panels, charge coupled device type cameras, video storage techniques, inter alia, to detect and identify electronic signal patterns transmitted thereto. The apparatus is also configured to detect pattern changes and image object movement. GRA

N85-16629# Department of the Navy, Washington, D. C.
BRAGG CELL SPECTRUM ANALYZER SPECIFICATION Patent Application
W. K. Burns, inventor (to Navy) Filed 5 Jun. 1984 14 p
(AD-D011320; US-Patent-Appl-SN-617659) Avail: NTIS HC A02/MF A01 CSCL 20/5

A Bragg cell RF spectrum analyzer of the type having a laser input wherein the laser input is coupled to the Bragg cell analyzer by a single-mode optical fiber for the purpose of improving the spatial quality of the laser, thus limiting side lobes of the input laser beam; and allowing the laser input to be remote from the Bragg cell. Author (GRA)

N85-16630# Rochester Univ., N. Y. Inst. of Optics.
OPTICS AND OPTO-ELECTRONIC SYSTEMS Final Report, 1 Aug. 1981 - 31 Jul. 1984
R. W. Boyd, N. George, D. G. Hall, M. C. Lea, and M. G. Raymer
19 Oct. 1984 16 p
(Contract DAAG29-81-K-0134)
(AD-A147277; ARO-18307.15-PH) Avail: NTIS HC A02/MF A01 CSCL 20/6

The work done as a result of this contract had as its objective an understanding of the basic principles that determine the performance of modern optoelectronic systems. The research was carried out by nine faculty members of the Institute of Optics and their students and included topics in integrated optics, non linear optics, image analysis, and electro optical devices. Overall coordination of the program was carried out by the Director of the Institute. The program was organized so as to maximize the involvement of graduate students in the research, recognizing the fact that the Institute of Optics is one of the world's major academic centers specializing in optics. GRA

N85-16631# Northwestern Univ., Evanston, Ill. Dept. of Electrical Engineering and Computer Science.
THEORY AND APPLICATIONS OF TWO-PHOTON QUANTUM OPTICS Annual Summary Report, No. 1, 1 Oct. 1983 - 30 Sep. 1984
H. P. Yuen 29 Oct. 1984 6 p
(Contract N00014-82-K-0631; RR0-1107)
(AD-A147382) Avail: NTIS HC A02/MF A01 CSCL 20/6

The discovery of optical systems exhibiting large observable squeezing is being attempted in two ways. The first consists of a general operator analysis on the mechanism of squeezing generation, to explore possible novel optical systems that may yield large squeezing. In the second method, new quantum optics techniques are developed for detailed analysis of coupled matter-field systems that are known to exhibit squeezing, in order to understand how certain imperfections in real systems can be overcome. GRA

N85-16632# Rome Air Development Center, Griffiss AFB, N.Y.
ANALYTIC MODELS FOR RADIATION INDUCED LOSS IN OPTICAL FIBERS 2: A PHYSICAL MODEL
J. A. Wall Jun. 1984 17 p
(AF Proj. 2306)
(AD-A147442; RADC-TR-84-155) Avail: NTIS HC A02/MF A01 CSCL 18/6

An analytic expression based on a relatively simple phenomenological physical model for radiation induced losses in optical fibers was derived. The expression yielded excellent fits to RADC data on steady-state induced loss in optical fibers. Using the model, it may be possible to gain insight into the reasons for differences in the radiation responses of nominally similar fibers. This could give clues for procedures to improve the radiation hardness of optical fibers. Author (GRA)

N85-16633# Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
SWITCHABLE ZERO ORDER DIFFRACTION GRATINGS AS LIGHT VALVES Technical Report, 1 Oct. 1983 - 30 Sep. 1984
9 Oct. 1984 6 p
(Contract N00014-84-K-0073)
(AD-A147575) Avail: NTIS HC A02/MF A01 CSCL 20/6

The aim of this project is to fabricate a light valve which operates on the principle of the cancellation of the zero order of diffraction. The light valve consists of two facing aligned phase gratings in a transparent medium. Displacing one grating with respect to the other by one-half of one grating period switches the valve from a transmitting to an absorbing state. The light valve is to be about 1-2 mm square and be mass producible into matrix addressable arrays. Arrays of this type can operate as displays or as spatial light modulators for optical signal processing. We have chosen to fabricate the light element using polyvinilydine fluoride (PVF2) which is a transparent piezoelectric. The gratings are embossed into the plastic and the piezoelectricity is used to produce the motion needed for switching. Author (GRA)

N85-16634# Honeywell Systems and Research Center, Minneapolis, Minn.
RULE-BASED EVIDENCE ACCRUAL SYSTEM FOR IMAGE UNDERSTANDING
N. Marquina Sep. 1984 7 p
(Contract F49620-83-C-0134)
(AD-A147835; AFOSR-84-0945TR) Avail: NTIS HC A02/MF A01 CSCL 20/6

The main function of an evidence accrual system for image understanding is to sequentially update information on scene objects based on new sensor data or on non-sensory information such as intelligence. This paper presents a concept for sequentially updating information on scene objects. Scene objects and background (clutter) are represented by attributed relational graphs in which nodes represent objects of interest and arcs represent inter-object relations. Dynamic recognition/identification of nodes is accomplished by a belief/disbelief measure. Our experimental results with infrared images show improvements in natural scene object recognition over traditional image processing methods. Author (GRA)

N85-16635# Department of the Air Force, Washington, D.C.
BURIED JUNCTION ENHANCED SCHOTTKY BARRIER DEVICE Patent Application
L. H. Skolnik, inventor (to Air Force) Filed 22 Aug. 1984 7 p
(AD-D011399; US-Patent-Appl-SN-643139) Avail: NTIS HC A02/MF A01 CSCL 17/5

The present invention contemplates a completely submersed Schottky barrier junction in order to enhance collection efficiency of photogenerated carriers. Using a buried active back-to-back thin junction allows collection of carriers generated with momentum vectors in both the forward and reverse directions. Thus, the quantum efficiency and sensitivity of the infrared detector is substantially enhanced. In addition, thicker Schottky metallizations can be used to enhance spectral absorption of incident infrared lights. Author (GRA)

N85-16026# Joint Publications Research Service, Arlington, Va.
NONLINEAR PROCESSING OF OPTICAL PULSE SIGNALS Abstract Only
K. Ye. Rumyantsev *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 3 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved.: Radioelektron. (Kiev), v. 27, no. 5, May 1984 p 91-92 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16124# Tokyo Astronomical Observatory (Japan).
EXTENDING MAGNITUDE STANDARDS TO FAINT STARS WITH A SUB-BEAM PRISM
Keiichi Ishida *In* Royal Observatory Astron. Phot. 1984 1984 p 197-202 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

N85-16125# Tokyo Astronomical Observatory (Japan).
SUB-BEAM PRISM USED AT THE BOSSCHA SCHMIDT TELESCOPE
Takeshi Noguchi, Moedji Raharto (Bosscha Observatory), and Bambang Hidayat (Bosscha Observatory) *In* Royal Observatory Astron. Phot. 1984 1984 p 203-205 refs (For primary document see N85-16102 07-35)
Avail: NTIS HC A15/MF A01

75 PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics*. For space plasmas see *90 Astrophysics*.

N85-16636*# Texas Univ. at Dallas, Richardson. Center for Space Science.
RESEARCH RELATIVE TO PLASMA TRANSPORT ACROSS THE MAGNETOPAUSE Final Report
Walter J. Heikkila 14 Jan. 1984 10 p refs
(Grant NAG5-366)
(NASA-CR-174300; NAS 1.26:174300) Avail: NTIS HC A02/MF A01 CSCL 20I

The concept of how magnetosheath plasma can cross the magnetopause is one of the key elements for a global view of the magnetosphere. According to this view, viscous interaction is the main process to produce convection of plasma in the magnetotail, resulting in auroral phenomena, and other related processes. The mechanism is illustrated herein. The key element is that the electric field is not constant, as assumed in reconnection theories, but reverse within the magnetopause current sheet. Particles, representing magnetosheath ions were traced as they impinge upon the magnetopause. R.S.F.

N85-16637*# National Aeronautics and Space Administration, Washington, D. C.
HIGH-POWER RADIATING PLASMA
V. B. Rozanov and A. A. Rukhadze Nov. 1984 28 p refs Transl. into ENGLISH from Priroda (USSR), no. 5, May 1984 p 30-41 Original language document was announced in IAA as A84-40275 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-4005)
(NASA-TM-77784; NAS 1.15:77784) Avail: NTIS HC A03/MF A01 CSCL 20I

The physical principles underlying the use of radiating plasmas for the optical pumping of lasers are described. Particular consideration is given to the properties of radiating plasmas; radiation selectivity; the dynamics, equilibrium, and stability of radiating plasmas; the radiative Reynolds number; and experimental results on radiating discharges. B.J.(IAA)

N85-16638# Naval Research Lab., Washington, D. C. Laser Plasma Branch.
LONGER-SCALELENGTH PLASMA PERTURBATIONS BY AN INTENSE LASER BEAM
J. A. Stamper, F. C. Young, M. J. Herbst, S. P. Obenschain, J. H. Gardner, R. H. Lehmberg, E. A. McLean, J. Grun, K. J. Kearney (Mission Research Corp., Alexandria, Va.), and B. H. Ripin 28 Sep. 1984 20 p
(Contract DE-AI08-79DP-40092)
(AD-A147005; NRL-MR-5173) Avail: NTIS HC A02/MF A01 CSCL 20/9

Plasmas with long (up to 400 microns at 0.1 critical density) density scalelengths are used in laser-plasma interaction experiments in order to more closely approximate the blowoff conditions expected for a high-gain ICF pellet. These long-scalelength plasmas are produced by focusing one beam (approx 150 J, 4 nsec FWHM) of the Pharos II Nd laser lambda = 1.054 micron) to a large focal spot (approx 1 mm). A second beam is tightly focused within this spot to produce intensities up to 10 to the 15th power W/sq cm. The pulsewidth of the second beam is only 0.3 nsec to minimize hydrodynamic perturbation to the long-scalelength plasma. The peak intensities of the two beams occur at the same time. Plasma density perturbations are monitored by side-on imaging a second-harmonic emission. At low energy in the short-pulse beam, this emission occurs only at distances from the target surface corresponding to n sub c < or = n < n sub c, showing no evidence for perturbation of the long-scalelength low density plasma. However, at higher energy, emission is seen well in front of the target, in highly-localized, filamentary-appearing regions. This observation is consistent with the formation of a low density channel along the high-intensity beam path. The tendency to form a channel is predicted by a 2-D hydrodynamics code. The structure, intensity dependence, and polarization of the second-harmonic emission are consistent with self-focusing. Self-focusing of the incident beam in this experiment is shown to be consistent with a steady-state, self-focusing theory. GRA

N85-16639*# Naval Research Lab., Washington, D. C. Space Plasma Physics and Applications Research Group.
ELECTROSTATIC WAVE OBSERVATION DURING A SPACE SIMULATION BEAM-PLASMA-DISCHARGE (BPD) Interim Report
D. N. Walker and E. P. Szuszczewicz 19 Nov. 1984 32 p
(NASA-CR-174286; NAS 1.26:174286; AD-A147480; NRL-MR-5434) Avail: NTIS HC A03/MF A01 CSCL 20I

In continuing the investigation of a series of space simulation experiments in the large vacuum chamber at the Johnson Space Center, the authors have analyzed observed extremely low frequency waves through associated measurements of electron density, electron temperature, plasma potential, power spectral density, and cross-correlation spectra. The experimental condition was that of a Beam-Plasma-Discharge with an electron gun voltage of 1.6 keV and a beam currant of 40 ma in an external magnetic field of 1.5 gauss. Phase delays (obtained from cross-correlation measurements of density fluctuations) along with the measurements of plasma potential and frequency as a function of radius have been used to compare results to a zero-order slab model of non-local azimuthal drift wave propagation. Based on the results of plasma potential measurements, the laboratory rotational velocities obtained from frequency observations have been corrected for E X B Doppler shift to compare with theory in the plasma frame. In particular the inferred wave phase velocity in the plasma frame is found to be near one-half the electron diamagnetic drift velocity based on observations and the equilibrium drift correction. Although the authors' measurements do no uniquely define a propagation mode, they discuss a model of azimuthal drift wave propagation which is consistent with their observations. Author (GRA)

N85-16640# Air Force Geophysics Lab., Hanscom AFB, Mass.
A PROPAGATOR EXPANSION METHOD FOR SOLVING LINEARIZED PLASMA KINETIC EQUATIONS WITH COLLISIONS Environmental Research Papers, Jun. 1983 - Jun. 1984
J. R. Jasperse 25 Jun. 1984 15 p
(AF Proj. 2301)
(AD-A147524; AFGL-TR-84-0170; AFGL-ERP-884) Avail: NTIS HC A02/MF A01 CSCL 20/9

In this paper, we present a propagator expansion method for solving linearized plasma kinetic equations with collisions. The essence of the method is the representation and use of the collisional propagator for a given problem as an expansion in powers of the collision frequency. For the linearized Balescu-Lenard collision operator and for the zero-order distribution function Maxwellian, we obtain an exact expression for the collisional damping rate in the long wavelength approximation to the first order in the plasma parameter. Author (GRA)

N85-16641# Air Force Geophysics Lab., Hanscom AFB, Mass.
SWIR AND VISIBLE ATOMIC EMISSION FROM LASER-PRODUCED OXYGEN AND NITROGEN PLASMAS
J. B. Lurie, S. M. Miller, and R. A. Armstrong 15 Jun. 1984 19 p
(AF Proj. 2310)
(AD-A147528; AFGL-TR-84-0161; AFGL-ERP-882) Avail: NTIS HC A02/MF A01 CSCL 17/5

We report the first observations of structured infrared emission from atomic Rydberg states produced by three-body recombination of laser-produced oxygen and nitrogen plasmas. Emission is observed in the 2.00 to 3.25 microns spectral region through the use of a simple grating monochromator. In addition, we discuss time-resolved visible emission studies that provide temporal information on the atomic infrared-emitting states. Implications are considered for the observation of LWIR emission from higher Rydberg levels. GRA

N85-16642# Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
EXPLOSIVE EMISSION CATHODE PLASMAS IN INTENSIVE RELATIVISTIC ELECTRON BEAM DIODES Ph.D. Thesis Final Report, 3 Nov. 1980 - 31 Aug. 1984
David Dickson Hinshelwood Sep. 1984 323 p
(Contract N00014-83-K-2024)
(AD-A147917) Avail: NTIS HC A14/MF A01 CSCL 20/9

An experimental study of cathode plasmas in planar diodes driven by a Sandia Nereus accelerator (270 kV, 60 kA, 70 ns), with particular attention devoted to plasma uniformity and expansion velocity, has been carried out. The diode current density was varied over a factor of ten and the rate of rise dE/dt of the applied field was varied over a factor of six. Different cathode materials, coatings, and surface roughnesses were used and the effects of glow discharge cleaning and in situ heating were examined. Framing photography, electron beam dosimetry, perveance measurements, optical interferometry, and (spatially and temporally resolved) spectroscopy were used to diagnose the plasma uniformity, electron beam uniformity, plasma front motion, electron density, plasma composition, motion of distinct species, electron temperature, and ion (and neutral) densities. GRA

N85-16643# Tennessee Univ., Knoxville.
FAR-INFRARED LASER DIAGNOSTIC ON EBT AND EXTREME FAR-FORWARD LASER SCATTERING ON ISX
W. H. Casson, D. P. Hutchinson (ORNL, Tenn.), C. H. Ma (ORNL, Tenn.), P. A. Staats (ORNL, Tenn.), and J. B. Wilgen Sep. 1984 10 p refs Presented at the 5th APS Topical Conf. on High Temp. Plasma Diagn., Tahoe City, Calif., 16 Sep. 1984
(Contract DE-AC05-84OR-21400)
(DE85-001788; CONF-840922-1) Avail: NTIS HC A02/MF A01

A far-infrared (FIR) laser scattering diagnostic was installed on the ELMO Bumpy Torus (EBT) experiment, and tests conducted on the system using a TPX Bragg cell show that the system is fully functional. Scattering experiments to date showed only small detectable signal levels during normal operation and during ion cyclotron heating (ICH) fast-wave and slow-wave propagation experiments. On the Impurity Study Experiment (ISX) the output signal from the RF amplifiers of the FIR interferometer was spectrum analyzed and shows frequency-shifted sidebands that correspond to extreme far-forward scattering of the laser beam as it passes through the plasma. Although the scattered signal cannot be resolved spatially, the scattering intensity provides information about density fluctuation levels and MHD activity during different modes of operation. Agreement was found with measurements made by the X-ray diagnostic and the heavy-ion beam probe. DOE

N85-16644# Oak Ridge National Lab., Tenn.
EXPERIMENTAL RESULTS ON TOKAMAK BETA LIMITS FROM ISX-B
G. H. Neilson 1984 4 p refs Presented at INTOR/HET Workshop on Plasma Transport in Tokamaks, Princeton, N.J., 9 Jul. 1984
(Contract DE-AC05-84OR-21400)
(DE84-015372; CONF-840776-1) Avail: NTIS HC A02/MF A01

It is observed that the expression A(Beta)q sub psi/kappa = 18% defines one of the operational boundaries for ISX-B and other Tokamaks. Although this expression closely coincides with the simplest expressions for ideal MHD instability thresholds, it is not obvious that it constitutes a real Tokamak beta limit. Confinement degradation is observed well within this operating boundary, and there is neither experimental evidence nor a satisfactory theoretical model connecting this phenomenon with ideal MHD activity. DOE

N85-16034# Joint Publications Research Service, Arlington, Va.
SLOW SURFACE MAGNETOPLASMA WAVES IN OBLIQUE MAGNETIC FIELD Abstract Only
V. I. Baybakov, V. N. Dapko, and Yu. V. Kistovich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 10 Transl. into ENGLISH from Radiotekhn. i Elektron. (Moscow), v. 29, no. 6, Jun. 1984 p 1201-1203 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16038# Joint Publications Research Service, Arlington, Va.
REFLECTION THEOREMS FOR SOME ANISOTROPIC MEDIA Abstract Only
V. N. Krasilnikov and A. V. Tyukhtin *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 12 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 1018-1026 Original language document previously announced in IAA as A85-11806 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16039# Joint Publications Research Service, Arlington, Va.
TRANSFORMATION OF ELECTROMAGNETIC WAVES IN PLASMA WITH RANDOMLY-HETEROGENEOUS MAGNETIC FIELD Abstract Only
N. S. Bellyustin and M. A. Rayevskiy *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 13 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 991-998 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

76 SOLID-STATE PHYSICS

Includes superconductivity.

For related information, see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

N85-16645 British Library Lending Div., Boston Spa (England).
DEFECTIVE NATURE OF THE CRYSTALLINE LATTICE OF NICKEL FERRITE-BASED SOLID SOLUTIONS Abstract Only
V. I. Arkharov, V. N. Bososlovskii, V. P. Paschenko, E. E. Solovef, and A. A. Shemyakov 24 Sep. 1984 1 p Transl. into ENGLISH from Strukt. Svoistva Ferritov (USSR), v. 74 p 69-72
(BLL-WH-595-(9091.9F)) Copyright. Avail: British Library Lending Div., Boston Spa, Engl.

The question of the detective nature of the crystalline lattice of ferrites is explored. There is no disagreement in regard to the type of crystalline lattice defect in iron spinel compounds and solid solutions based on a deviation from the stoichiometric composition in the direction of a loss of oxygen. Opinion is divided in regard to the defects occurring in the crystalline lattice of iron spinels due to a deviation in the composition in the direction of an oxygen deficiency. Defects in the crystalline lattice of nickel ferrite-based solid solutions formed within the limits of single-phase specimens were studied. The experimental material was a mixture of NiO and alpha-Fe2O3 in a non-equimolar ratio with excess alpha-Fe2O3. The ratio of nickel to iron ions was 0.367. Preliminary feritization was carried out in air for 3 h at 1173 K. After rounding up of the mixture, specimens were compressed and subsequently annealed for 4 h at 1473 K in atmospheres with different partial oxygen pressures. Oxygen, air, carbon dioxide, and carbon

dioxide/carbon monoxide mixture and argon were used as experimental atmospheres. After annealing, the specimens were cooled for 24 h in the atmosphere in which they had undergone annealing. B.W.

N85-16646 Department of the Air Force, Washington, D.C.
TWO CARRIER DUAL INJECTOR APPARATUS Patent
D. J. DiMaria and H. N. Kotecha, inventors (to Air Force) Issued 18 Sep. 1984 4 p Supersedes AD-D008771
(AD-D011357; US-Patent-4,472,726; US-Patent-Appl-SN-260878; US-Patent-Class-357-6) Avail: US Patent and Trademark Office CSCL 09/1

A two carrier dual injector semiconductor apparatus utilities a pair of injector gates for simultaneously injecting holes and electrons into a series stack of insulator layers. The stacked insulator layers which may be arranged in a MIM or MIS configuration have injecting layers near opposing metal gates from injecting either electrons as holes into the insulator layers depending upon the polarity of the applied bias voltage. The apparatus is capable of high-current low-voltage carrier injection while maintaining a stable trapped spaced charge within the stack of insulator layers. GRA

N85-16647 Department of the Air Force, Washington, D.C.
COMBUSTION CHAMBER FLOATWALL PANEL ATTACHMENT ARRANGEMENT Patent
C. J. Griffin, inventor (to Air Force) Issued 18 Sep. 1984 5 p Supersedes AD-D009946
(AD-D011358; US-Patent-4,471,623; US-Patent-Appl-SN-434647; US-Patent-Class-60-752) Avail: US Patent and Trademark Office CSCL 21/2

The abstract discloses an attachment arrangement in a combustion chamber of a gas turbine powerplant, having a double wall structure formed by a separate combustor shell and at least one floatwall panel. The arrangement includes a pair of hook-like projections protruding from the panel and through the shell and a pair of thin plates for interengaging the hook-like projections on one side of the shell opposite to the other side thereof which faces the panel. Each of the hook-like projections has an outer portion spaced from the one side of the shell and extending generally parallel thereto. Each of the plates is tapered in cross section for adapting each plate to be fitted in a wedged condition between the outer portion of one of the projections and the one side of the shell to retain the panel in a desired predetermined position adjacent to the shell. Also, the plates are rigidly connected to the shell and to one another. GRA

N85-16648*# National Aeronautics and Space Administration, Washington, D. C.
ELECTRONIC STRUCTURE AND PROPERTIES OF MAGNETIC DEFECTS IN Co(1+x)Al(1-x) AND Fe(1+x)Al(1-x) ALLOYS Ph.D. Thesis - Paris Univ.
D. Abbe Jul. 1984 91 p refs Transl. into ENGLISH of "Structure Electronique et Proprietes des Defauts Magnetiques des Alliages Co(1+x)Al(1-x) et Fe(1+x)Al(1-x)" rept. ONERA-NT-1976-5 Paris, ONERA, Jul. 1976 p 1-73 Original language document was announced as N77-21977 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-77498; NAS 1.15:77498; ONERA-NT-1976-5) Avail: NTIS HC A05/MF A01 CSCL 20L

CoAl and FeAl compounds are developed along two directions. Magnetic susceptibility and specific heat at low temperature on (NiCo)Al and (CoFe)Al ternary alloys are in good agreement with band calculations. Results on magnetization and specific heat under field at low temperature on nonstoichiometric compounds show clearly the importance of the nearest neighbor effects. In the case of CoAl, the isolated cobalt atoms substituting aluminum are characterized by a Kondo behavior, and, for FeAl, the isolated extra iron atoms are magnetic and polarize the matrix. Moreover, for the two compounds, clusters of higher order play a considerable part in the magnetic properties for CoAl, these clusters also seem to be characterized by a Kondo behavior, for FeAl, these clusters whose moment is higher than in the case of isolated atoms, could be constituted of excess parts of iron atoms. Author

N85-16649*# Colorado State Univ., Fort Collins. Dept. of Physics.
[UNDERSTANDING THE HIGH PRESSURE PROPERTIES OF MOLECULAR SOLIDS AND MOLECULAR SURFACES DEPOSITED ON HETROGENEOUS SUBSTRATES] Final Report
Richard D. Etters [1985] 8 p refs
(Grant NAG2-171)
(NASA-CR-174262; NAS 1.26:174262) Avail: NTIS HC A02/MF A01 CSCL 20L

Work directed toward understanding the high pressure properties of molecular solids and molecular surfaces deposited on hetrogeneous substrates is reported. The motivation, apart from expanding our basic knowledge about these systems, was to understand and predict the properties of new materials synthesized at high pressure, including pressure induced metallic and superconducting states. As a consequence, information about the states of matter of the Jovian planets and their satellites, which are natural high pressure laboratories was also provided. The work on molecular surfaces and finite two and three dimensional clusters of atoms and molecules was connected with the composition and behavior of planetary atmospheres and on the processes involved in forming surface layers, which is vital to the development of composite materials and microcircuitry. Author

N85-16650# Sanders Associates, Inc., Nashua, N. H. Defense and Information Systems Div.
CRYSTAL GROWTH AND CHARACTERIZATION OF BaMgF4 Final Report, 13 Mar. 1983 - 31 Mar. 1984
T. M. Pollak Sep. 1984 31 p
(Contract N00014-83-C-0061)
(AD-A146805) Avail: NTIS HC A03/MF A01 CSCL 20/2

A crystal growth process employing the Czochralski technique was developed. Single crystals up to 2.0 cm in diameter by 7.0 cm in length were grown. Laue back reflection X-ray techniques coupled with optical microscopy were used to orient crystals with respect to the crystallographic axis and optical axis. The electro-optic coefficients for BaMgF4 were measured experimentally as compared to KDP. No non-zero coefficients were detected, within the sensitivity of the experiment. Analysis of the BaMgF4 structure indicates appropriate lattice sites for both divalent rare earth ions and divalent transition metal ions. The combination of substitutional sites and low growth temperature results in the potential as a laser host crystal. GRA

N85-16651# Stanford Univ., Calif. Solid State Electronics Lab.
ION IMPLANTATION AND LASER PROCESSING OF III-V COMPOUND SEMICONDUCTORS WITH APPLICATIONS TO THE FABRICATION OF MICROWAVE DEVICES Final Report, 1 Apr. 1981 - 31 Mar. 1984
J. F. Gibbons Sep. 1984 25 p
(Contract DAAG29-81-K-0061)
(AD-A146846; ARO-18020.5-EL) Avail: NTIS HC A02/MF A01 CSCL 20/12

An exploration of alternate doping sources was carried out with a particular interest in ultra thin film techniques such as would be expected to be of significance in integrated circuit applications of GaAs. Two major studies were conducted, one pertaining to silicon diffusion in GaAs using a rapid thermal processing cycle, and another concerned with the monolayer surface doping of GaAs that can be obtained from plated zinc sources. The results of these studies are contained. GRA

N85-16652# Paris VI Univ. (France).
LASER ANNEALING OF ION IMPLANTED SEMICONDUCTORS Final Technical Report
J. F. Morhange and M. Balkanski Jul. 1984 80 p
(Contract DAJA37-81-C-0587; DA Proj. 1T1-61102-BH-57)
(AD-A146979) Avail: NTIS HC A05/MF A01 CSCL 20/12

The effect of laser annealing on implanted semiconductors is studied by Raman spectroscopy. The behavior of normal modes

of gallium arsenide after laser annealing is interpreted with a theoretical model of the dynamics of the vibration of a microcrystallite. Raman spectroscopy of very heavily doped silicon, sub-picosecond spectroscopy, and the experimental determination of the temperature of silicon at the spot of a continuous laser are among the subjects discussed. R.J.F.

N85-16653# Department of the Navy, Washington, D. C.
METHOD OF PREPARING SINGLE CRYSTALLINE CUBIC SILICON CARBIDE LAYERS Patent Application
A. Addamiano, inventor (to Navy) Filed 22 Aug. 1984 14 p
(AD-D011305; US-Patent-Appl-SN-643327) Avail: NTIS HC A02/MF A01 CSCL 07/2

A method of making very pure cubic silicon carbide, SiC, comprising the steps of: loading a first inner graphite cup of a Lely type furnace while cold with a large number of crystals, of SiC that are used as substrates; sealing the first cup with a graphite lid; inserting the first cup with a graphite lid; inserting the first cup into a second graphite cup and inserting them into the furnace; filling the area between the first cup and the second cup with SiC; heating the first cup to between 2300 C and 2700 C until an atmosphere saturated with Si, C, SiC2 and Si2C is created; and cooling the furnace quickly to a temperature less than 1800 C.
Author (GRA)

N85-16654# Edinburgh Univ. (Scotland). Dept. of Physics.
A STUDY OF STRUCTURAL PHASE TRANSITIONS USING LIGHT SCATTERING TECHNIQUES Final Technical Report, Jan. 1982 - Apr. 1984
W. Taylor Apr. 1984 19 p
(Contract DAJA37-82-C-0060)
(AD-A147261) Avail: NTIS HC A02/MF A01 CSCL 20/2

Raman and Brillouin light-scattering spectroscopy have been used to study a variety of materials including Ag3AsS3 (proustite), Ag3SbS3 (pyrargyrite), NaKC4H406.4H20 (Rochelle salt), CaC-4H406.4H20 (Calcium tartrate), Li2B407 (lithium diborate), BaTiO3 (barium titanate), Pb5Ge3011 (lead germanate), C3N3H3 (s-triazine) and SrTiO3 (strontium titanate). Most of these materials undergo structural phase transitions of one kind of another and the spectroscopic data have been used to help identify and characterize these transitions where they exist. The presence of order-disorder phenomena is shown to be important in several instances but not necessarily directly involved in the phase-transition mechanism. In a subsidiary study a molecular crystal dynamics computer simulation has been carried out, successfully modelling the anharmonic behavior of crystal naphthalene. GRA

N85-16655# Hughes Research Labs., Malibu, Calif.
CLUSTERS OF DEFECTS IN SEMICONDUCTORS Final Report, 1 Feb. 1981 - 14 Jul. 1983
J. P. Baukus Aug. 1984 116 p
(Contract N00014-81-C-0285; ARPA Order 4174)
(AD-A147426) Avail: NTIS HC A06/MF A01 CSCL 20/2

The purpose of this program was to study the clustering of defects in semiconductors. Silicon crystals were grown by the Czochralski and floating-zone techniques; GaAs was grown by the liquid-encapsulated Czochralski method. Characterization methods included Hall effect, infrared transmission, photoluminescence, neutron activation analysis, and charged particle activation analysis. Cal Tech studied the defect associated with the POR luminescence lines that they discovered in In-doped Si. Their experimental and theoretical program was aimed at first determining the chemical species that participate in the formation of the defect and then to study the formation and breakup of the defect under a number of experimentally varied conditions. The program to identify the defect consisted of selectively introducing various chemical species and studying the resulting increases or decreases in the concentration of the defect level, and then introducing isotopes of the chemical species to study the changes induced in the local phonon modes. Atom Sciences demonstrated the technique of Sputter Initiated Resonance Ionization Spectroscopy (SIRIS) for the detection of impurity atoms in silicon. GRA

N85-16656# Lincoln Lab., Mass. Inst. of Tech., Lexington.
SOLID STATE RESEARCH Quarterly Technical Report, 1 Nov. 1983 - 31 Jan. 1984
A. L. McWhorter 15 Feb. 1984 103 p Sponsored in part by NASA, Army, Navy, DARPA and DOE
(Contract F19628-80-C-0002)
(NASA-CR-174285; NAS 1.26:174285; AD-A147429; Rept-1984-1; ESD-TR-84-006) Avail: NTIS HC A06/MF A01 CSCL 20L

This report covers in detail the solid state research work of the Solid State Division at Lincoln Laboratory for the period 1 November 1983 through 31 January 1984. The topics covered are Solid State Device Research, Quantum Electronics, Materials Research, Microelectronics, and Analog Device Technology. Funding is primarily provided by the Air Force, with additional support provided by the Army, DARPA, Navy, NASA, and DOE.
Author (GRA)

N85-16657# Xerox Palo Alto Research Center, Calif.
PREPARATION AND EVALUATION OF ZnSe AND ZnS SUB X Se SUB 1-x EPITAXIAL LAYERS ON Ge SUBSTRATES FOR APPLICATIONS IN SURFACE PASSIVATION AND HETERO-JUNCTION DEVICES Final Technical Report
W. E. Stutius and J. G. Werthen Griffiss AFB, N.Y. RADC Aug. 1984 45 p
(Contract F19628-82-C-0033)
(AD-A147432; RADC-TR-84-17) Avail: NTIS HC A03/MF A01 CSCL 20/2

This report summarizes a detailed study of ZnSe and ZnSx-Se1-x epitaxial growth on germanium and gallium arsenide substrates, for application in surface passivation and heterojunction devices. These layers were prepared by a novel low pressure, low temperature organometallic chemical vapor deposition (OM-CVD) process. Both nominally undoped, intrinsic ZnSe and Al-doped, highly conductive n-type ZnSe were prepared by this method. Excellent epitaxial growth was achieved as indicated by the large intensity in the near bandgap photoluminescence and the rather weak intensity in the self-activated luminescence spectra. This indicates a low concentration of intrinsic and extrinsic defects and a low compensation ratio. An important relationship was observed between reproducibility of layer characteristics and substrate and reactor preparation. Also, deep center luminescence revealed that ZnSe layers deposited on both GaAs and Ge (100) surfaces have luminescence properties superior to those deposited on other substrate orientations. GRA

N85-16658# Washington Univ., St. Louis, Mo. Dept. of Electrical Engineering.
ELECTRON DISTRIBUTION FUNCTION AND MOBILITY IN 3-5 COMPOUNDS FOR HIGH AND LOW FIELDS Special Technical Report, 1 Sep. 1982 - 31 May 1984
S. H. Soh and B. W. Abraham-Shrauner Sep. 1984 127 p
(Contract N00014-82-K-0692; RR0-2102)
(AD-A147447; WU/EE-64463-1) Avail: NTIS HC A07/MF A01 CSCL 20/12

Electron distributions are calculated for low and high electric fields in 3-5 semiconductors with polar optical scatttering. Approximate analytic expressions are derived by two analytic methods and compared to results found by a perturbation method and iteration method for low electric fields. Electron mobility is calculated. For high electric fields an expansion inversely in the electric field gives an approximate electron distribution function valid at low energies. A non-parabolic energy bond and p-wave scattering (they and interdependent) do not affect the asymmetrical part of the distribution function within the central valley; hence, they do not cause the negative differential resistance. GRA

N85-16659# California Inst. of Tech., Pasadena.
X-RAY AND BACKSCATTERING ANALYSIS OF ION IMPLANTATION PHENOMENA IN GaAs AND RELATED COMPOUNDS Final Technical Report, 5 Aug. 1982 - 4 Aug. 1984
M. A. Nicolet and T. Vreeland, Jr. 4 Aug. 1984 195 p
(Contract MDA903-82-C-0348)
(AD-A147449) Avail: NTIS HC A09/MF A01 CSCL 20/12

This report presents an overview of a two-year study of the structure of 3-5 semiconductor materials with a powerful new analysis technique (kinematic modeling of double-crystal X-ray diffraction), complemented by two well-established techniques (backscattering spectrometry and transmission electron microscopy). The kinematic modeling approach to X-ray diffraction was developed at Caltech by Speriosu for studies of magnetic garnets, but clearly had great additional potential for studying the crystalline structure of semiconductors. These three techniques have been used to study ion implantation and annealing phenomena in uniform 3-5 semiconductors and to extend the kinematic modeling of X-ray diffraction for high precision analysis of bilayer and multilayer epitaxial 3-5 systems. In the latter application, this method has proven to be superior to all other known techniques. GRA

N85-16660# Washington Univ., St. Louis, Mo. Dept. of Electrical Engineering.
TRANSPORT PROPERTIES AND DISTRIBUTION FUNCTIONS IN 3-5 SEMICONDUCTORS Final Technical Report, 1 Sep. 1982 - 31 May 1984
B. W. Abraham-Shrauner Nov. 1984 7 p
(Contract N00014-82-K-0692)
(AD-A147525; WU/EE-64463-2) Avail: NTIS HC A02/MF A01 CSCL 09/1

Approximate analytical expressions for electron distribution functions in 3-5 semiconductors have been derived for high and low electric fields. For low electric fields two analytic methods were used and compared with an earlier iteration method and a new perturbation method. All gave similar distribution functions and drift mobility. For high electric fields the electron distribution function was found within the diffusion approximation by an expansion inversely in the electric field. For Al0.25In0.75 as the effects of p-wave scattering and nonparabolic energy bands were not found to be the cause of the negative differential resistance. Alloy scattering in ternary semiconductors was treated in the coherent potential approximation. The validity of the diffusion and maximum anisotropy approximation has been assessed by an expansion inversely in the electric field of the polar optical collision term in high electric fields. GRA

N85-16661# Rutgers - The State Univ., Piscataway, N. J. Dept. of Mechanics and Materials Science.
TEMPERATURE DEPENDENCE OF THE CRYSTAL STRUCTURES OF NYLON 11
K. G. Kim, B. A. Newman, and J. I. Scheinbeim 28 Sep. 1984 18 p
(Contract N00014-80-C-0795)
(AD-A147563; TR-5) Avail: NTIS HC A02/MF A01 CSCL 20/2

Careful examination of the X-ray diffraction patterns from melt-crystallized Nylon 11 films showed significant discrepancies with the proposed alpha-form structure. These discrepancies did not disappear after annealing the samples. The temperature dependence of the d-spacings of the two strongest peaks showed further evidence that the melt-crystallized and solution cast films (alpha-form) possess different crystal structures. These results suggest a different crystal structure for the melt-crystallized films, and this would help explain the rather low piezoelectric response of these films and also the failure to observe a rapid decrease in polarization at the transition temperature. GRA

N85-16662# Rockwell International Corp., Thousand Oaks, Calif. Microelectronics Research and Development Center.
ALUMINUM NITRIDE INSULATOR FOR 3-5 MIS (METAL-INSULATOR-SEMICONDUCTOR) APPLICATIONS Interim Report, Jul. 1982 - Jun. 1983
K. R. Elliott, R. W. Grant, and M. D. Lind Sep. 1984 21 p
(Contract F49620-82-C-0034)
(AD-A147842; MRDC41116.1IR; AFOSR-84-0974TR) Avail: NTIS HC A02/MF A01 CSCL 20/12

A reactive molecular beam epitaxial (MBE) process was developed to deposit AlN on GaAs substrates. AlN films on GaAs are investigated for possible metal-insulator-semiconductor (MIS) applications. Following chemical etching, atomically clean GaAs substrates are prepared by thermal cleaning in ultra-high vacuum. AlN is grown by using Al and NH3 sources. In situ Auger electron analysis shows no detectable oxygen or carbon contamination in the AlN films. Auger and X-ray analysis are used to confirm the AlN stoichiometry. The AlN is crystalline and has the wurtzite type of crystal structure which is hexagonal with space group P6 sub 3 mc. Far infrared transmission and Raman scattering measurements also identify the films as stoichiometric AlN. Capacitance-voltage measurements for the MIS structures are reported. GRA

N85-16045# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF MOMENTS OF INITIAL ESTIMATE DURING LINEAR APPROXIMATION OF DISTRIBUTION OF EJECTED IMPURITY Abstract Only
A. V. Amirkhanov, V. A. Kazinov, and V. R. Fayzrakhmanov *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 40 Transl. into ENGLISH from Miroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 228-231 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16046# Joint Publications Research Service, Arlington, Va.
DEPENDENCE OF BREAKDOWN VOLTAGE FOR p-n JUNCTION ON PARAMETERS OF ION IMPLANTATION AND SEMICONDUCTOR HEAT TREATMENT Abstract Only
N. V. Makarets, M. A. Rozanova, G. L. Falko, and A. M. Fedorchenko *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 42 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 264-268 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16047# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF PARAMETERS OF DOPED THIN SEMICONDUCTOR LAYERS FROM PLASMATIC MINIMUM OF REFLECTION COEFFICIENT FOR INFRARED RADIATION Abstract Only
N. A. Denisova, T. A. Kruze, A. V. Rezvov, and D. I. Tetelbaum *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 42 Transl. into ENGLISH from Mikroelektron. (Moscow), v. 13, no. 3, May - Jun. 1984 p 269-275 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

77 THERMODYNAMICS AND STATISTICAL PHYSICS

Includes quantum mechanics; and Bose and Fermi statistics.

For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

N85-16663*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER PROGRAM FOR CALCULATION OF COMPLEX CHEMICAL EQUILIBRIUM COMPOSITIONS AND APPLICATIONS. SUPPLEMENT 1: TRANSPORT PROPERTIES
Sanford Gordon (Gordon (Sanford) and Associates), Bonnie McBride, and Frank J. Zeleznik Oct. 1984 26 p refs
(NASA-TM-86885; E-2348; NAS 1.15:86885) Avail: NTIS HC A03/MF A01 CSCL 20M

An addition to the computer program of NASA SP-273 is given that permits transport property calculations for the gaseous phase. Approximate mixture formulas are used to obtain viscosity and frozen thermal conductivity. Reaction thermal conductivity is obtained by the same method as in NASA TN D-7056. Transport properties for 154 gaseous species were selected for use with the program. Author

N85-16664# Purdue Univ., Lafayette, Ind. Thermophysical Properties Research Lab.
THERMOPHYSICAL PROPERTY TESTING USING TRANSIENT TECHNIQUES Final Scientific Report, 1 Feb. 1981 - 1 May 1984
R. E. Taylor, R. L. Shoemaker, J. A. Stark, and L. G. Koshigoe 29 Jun. 1984 52 p
(Contract F49620-81-K-0011)
(AD-A147085; TPRL-406; AFOSR-84-0869TR) Avail: NTIS HC A04/MF A01 CSCL 20/13

Transient techniques were applied to the study of energetic materials (AP, HMX, RDX and HTPB) used in solid rocket fuel to carbon/carbon materials used as rocket nozzles. Studies on AP included single crystals, pressed powders and AP/HTPB mixtures. It was found that the conductivity of AP can be considered isotropic, even the orthrohombic phase. The conductivity values for pure AP calculated from the AP/HTPB mixtures were somewhat larger than those measured directly on single crystals due to imperfections in the relatively large single crystals. Conductivity values for Beta HMX obtained on pressed powders are believed to be 20% below those that would be obtained on good single crystals if they were available. Delta phase values are believed representative. Conductivity data useful for modeling AP/binder and HMX/binder fuel from RT to combustion were obtained. Successful techniques for determining in-situ conductivity values for carbon fibers and matrix in c/c composites were developed. The relative roles of the fibers and matrix in c/c subject to transient heat fluxes were delineated. The advantages of off-axis testing were revealed. Diffusivity values corresponding to thermal conductivity results could be obtained. The presence of a surface layer in which interconstituent thermal gradients are important and beyond which they are negligible was demonstrated. Author (GRA)

80 SOCIAL SCIENCES (GENERAL)

Includes educational matters.

N85-16372# World Meteorological Organization, Geneva (Switzerland).
SOCIO-ECONOMIC IMPACT OF CLIMATE
Francisco J. Andrade (Sub-Secretariat for Agriculture and Hydraulic Resources, Mexico) *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 357-363 refs (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

N85-16378# Costa Rica Univ., San Jose. School of Physics.
REQUIREMENTS FOR TRAINING IN CLIMATE-RELATED SUBJECTS
Jorge A. Amador *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 428-434 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

N85-16379# Comision Nacional de Investigaciones Espaciales, Buenos Aires (Argentina).
EDUCATION AND TRAINING FOR THE CLIMATE RELATED ACTIVITIES IN LATIN AMERICA AND THE CARIBBEAN
Osvaldo F. Canziani *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 435-446 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

81 ADMINISTRATION AND MANAGEMENT

Includes management planning and research.

N85-16665*# National Aeronautics and Space Administration, Washington, D. C.
THE MANAGEMENT OF RESEARCH INSTITUTIONS: A LOOK AT GOVERNMENT LABORATORIES
Hans Mark and Arnold Levine 1984 311 p refs
(NASA-SP-481; NAS 1.21:481) Avail: NTIS HC A14/MF A01 CSCL 05A

Technology development; project management; employment patterns; research productivity; legal status of support services; functions of senior executives; the role of the sponsoring agency; research diversification; obstacles to technical innovation; organizational structures; and personnel management are addressed. B.G.

N85-16666# Army Procurement Research Office, Fort Lee, Va.
CONTRACTOR PRODUCTIVITY MEASUREMENT Final Report, Jul. 1981 - Jun. 1984
M. G. Norton and W. V. Zabel Jun. 1984 102 p
(AD-A146756; APRO-83-01-F) Avail: NTIS HC A06/MF A01 CSCL 05/1

The objective of this study was to develop and test measurement systems designed to complement the DOD Industrial Modernization Incentives Program (IMIP) by providing a productivity measurement and tracking system. The report describes the results of a survey of defense productivity measurement practices and identifies a number of techniques available to measure productivity and to help bring about required improvements. It is recommended that the described measurement techniques be tested in a defense contractor environment. Testing of (1) Multi Factor Productivity Measurement Model (MFPMM), (2) Cost Benefit Tracking (CB-A/T) Methodology and (3) the shared savings techniques is scheduled to commence in FY 1985 as a contracted effort. GRA

N85-16667# RAND Corp., Santa Monica, Calif.
MANAGING RECOVERABLE AIRCRAFT COMPONENTS IN THE PPB AND RELATED PROCESSES: EXECUTIVE SUMMARY Interim Report
J. H. Bigelow Jun. 1984 56 p
(Contract MDA903-81-C-0381)
(AD-A146806; RAND/R-3093-MIL) Avail: NTIS HC A04/MF A01 CSCL 15/5

ORACLE (Oversight of Resources And Capability for Logistics Effectiveness) explores how the requirements to buy and repair aircraft components are related to the peacetime and planned wartime availability and flying activity of aircraft. It operates by producing a summary database from the Air Force's DO41 (Recoverable Consumption Item Requirements Computation System), a database from which one can estimate almost instantaneously and with remarkable little error how the complete DO41 computation, involving 150,000 separate components, would have responded to a change in peacetime or wartime flying activity, aircraft availability, and a variety of other quantities. We feel that its primary use will be in the PPB process, to estimate budgetary consequences of changes in flying programs and the like. But it could also be used to help allocate funds during execution. Author (GRA)

N85-16668# Logistics Management Inst., Washington, D. C.
LIFE CYCLE COST MANAGEMENT MASTER PLAN FOR THE DEFENSE COMMUNICATIONS AGENCY Final Report, Nov. 1982 - Feb. 1984
J. S. Domin and F. L. Adler Apr. 1984 47 p
(Contract MDA903-81-C-0166)
(AD-A146876; LMI-DC301-B) Avail: NTIS HC A03/MF A01 CSCL 05/1

The Defense Communications Agency (DCA) has evolved from functioning simply as primary manager and operator of the

Defense Communications System to providing command, control, and communications (C3) mission analysis, long-term planning, and systems engineering and integration support at the National, Office of Secretary of Defense, Joint Chiefs of Staff, and Unified and Specified Command levels. To accommodate its enhanced role, DCA has identified a need to upgrade its life cycle cost (LCC) estimating and analysis capabilities consistent with new DoD acquisition policy in an environment of rapidly changing C3 technology and deregulation of the communications industry. DCA tasked LMI to prepare a master plan for developing LCC capabilities, including advanced-systom cost estimating, independent cost estimating, LCC quality assurance, comparative economic analysis, acquisition management analysis, program cost, tracking, special studies, and funding requirements forecasting for planning, programming, and budgeting. GRA

N85-16669# Logistics Management Inst., Washington, D. C.
ACQUISITION PLANNING AT THE DEFENSE COMMUNICATIONS AGENCY Final Report, Nov. 1982 - Feb. 1984
F. L. Adler, J. S. Domin, and K. H. Ward Apr. 1984 44 p
(Contract MDA903-81-C-0166)
(AD-A146877; LMI-DC301-A) Avail: NTIS HC A03/MF A01 CSCL 05/1

The Defense Communications Agency (DCA) has evolved from functioning simply as primary manager and operator of the Defense Communications System to providing command, control, and communications (C3) mission analysis, long-term planning, and systems engineering and integration support. To accommodate DCA's enhanced role, DCA tasked LMI to (1) define the acquisition planning process, including supportability, while (2) evaluating the effectiveness of the process as applied within DCA on a demonstration basis. Acquisition planning at DCA should be mission-oriented -- that is, it should be a process for acquiring C3 systems that are responsive to all mission needs. Through analysis of Department of Defense (DoD) and DCA mission areas, long-term plans should be developed and then implemented in the DoD Five Year Defense Program and budget by DCA, the Military Services and other Defense Agencies. In addition, system acquisition and supportability principles should be applied throughout the process. DCA is demonstrating this acquisition planning process in the development of the Minimum Essential Emergency Communications Network (MEECN) Master Plan. GRA

N85-16670# Technische Hochschule, Vienna (Austria).
DEVELOPMENT OF A MIXED SCANNING INTERACTIVE SYSTEM FOR DECISION SUPPORT Final Report, 1 Jun. 1980 - 31 Jul. 1983
A. P. Sage and C. C. White, III Jul. 1984 365 p
(Contract N00014-80-C-0542)
(AD-A146895; UVA/525358/SE85/101) Avail: NTIS HC A16/MF A01 CSCL 05/1

This research has resulted in the development of an interactive planning and decision support process that allows the decision-maker, rather than a paradigm, to iteratively select the mix of parameter value precision and alternative ranking specificity in multiple criteria decision situations. This process permits the decisionmaker to choose a behaviorally meaningful, rational approach to nondominated alternative selection that incorporates parameter imprecision. The parameters that can be imprecisely described are: probabilities, alternative scores on lowest level attributes, and attribute tradeoff weights. Development has placed emphasis on the behavioral relevance of the support process. This final report contains, in addition to a summary description of the research, reprints of papers published under ONR sponsorship that provide further analytical and behavioral discussions related to this process. GRA

N85-16671# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A STUDY OF THE RELATIONSHIP BETWEEN USER ATTITUDES AND THE SUCCESS OF THE MAJCOM AND AFRCE WORK INFORMATION MANAGEMENT SYSTEM M.S. Thesis
K. W. Moschner and F. W. Nightengale Sep. 1984 203 p
(AD-A146956; AFIT/GEM/LSM/84S-15) Avail: NTIS HC A10/MF A01 CSCL 05/1

The Work Information Management System (WIMS) is a $95 million project to improve operational and management control at Engineering and Services organizations of the USAF. Early implementation of part of this project at installations in the U.S. and Europe provided the opportunity to study its implementation success. This study is concerned with the factors that promote and jeopardize the success of WIMS. It determines the relationship between user attitudes and WIMS success, and explores how they are affected by the user's location, age, education, and prior computer experience. Using a mailed questionnaire to collect data from 400 respondents in the implementing organizations, and using factor analysis and regression analysis to analyze the data, the researchers found several significant relationships. Positive relationships were found between WIMS success and the user's attitudes about how WIMS improves job performance and how urgent WIMS was. Education of users was found to positively affect one's attitude about sense of urgency but to negatively affect WIMS success and one's attitude about job performance. GRA

N85-16672# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A SIMULATION MODEL FOR AIR LAUNCHED CRUISE MISSILE ENGINE MANAGEMENT M.S. Thesis
D. P. Rickard and T. G. Schommer Sep. 1984 143 p
(AD-A147018; AFIT/GLM/LSM/84S-55) Avail: NTIS HC A07/MF A01 CSCL 05/1

This paper examines the management of spares acquisition and logistics support activities for the Air Launched Cruise Missile (ALCM) engine. A SIMSCRIPT II.5 simulation model of the ALCM system is developed and the probable ranges of five relevant factors (transportation time, maintenance duration, engine failure rate, test duration and test loss rate) are determined. The model is manipulated using a factorial design with the five factors at the extremes of their ranges. An ANOVA is used to determine if changes in these of the ALCM engine. This capability is expressed as the average number of days an engine must be used as an operational asset past the manufacturer's warranty period without an overhaul. The ANOVA indicated that changes in transportation time and maintenance duration had a significant effect on the operational capability of the ALCM engine and thus required further investigation to refine their range of values. The model is used to test the effects (on a number of variables of interest) of changes in maintenance policies and timing. The model should easily be adaptable to reflect the environment of the Ground Launched Cruise Missile and the Submarine Launched Cruise Missile Systems. It could then be used to estimate the number of spare engines required in these systems to meet various engine capability levels and other management goals. GRA

N85-16673# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AN EVALUATION OF THE EFFECT OF ESTABLISHING A MINIMUM ECONOMIC ORDER QUANTITY (EOQ) ON THE AIR FORCE EOQ ITEM MANAGEMENT SYSTEM M.S. Thesis
T. E. Disz Sep. 1984 93 p
(AD-A147121; AFIT/GLM/LSM/84S-14) Avail: NTIS HC A05/MF A01 CSCL 15/5

Policy decisions concerning the Air Force economic order quantity (EOQ) item management system affect thousands of items, billions of dollars, and the readiness of the Air Force. This thesis was initiated as a result of a March 1983 Air Force audit Agency report finding potential waste of monies because of deviation from normal procurement cycle periods (PCPs). It evaluates different PCP policies and their affect on several system performance measures for the Air Force consumable item management system. The evaluation was performed using simulation models and actual Air Force item data. The results support the audit report showing increased cost and investment as a result of larger minimum PCPs. In the first year, larger minimum PCP policies require more stock fund dollars to fund inventory growth, approximately $1211M,

$1311M, and $1560M for the 3, 6, and 12 month policies respectively. After the inventory reaches its new level the differences in the annual commit dollar requirements between policies becomes insignificant. GRA

N85-16674# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
ON THE COMPLEXITY OF DISTRIBUTED DECISION PROBLEMS
J. Tsitsiklis and M. Athans Aug. 1984 6 p
(Contract N00014-77-C-0532)
(AD-A147174; LIDS-P-1398) Avail: NTIS HC A02/MF A01 CSCL 12/1

We study the computational complexity of finite versions of the simplest and fundamental problems of distributed decision making and we show that, apart from a few exceptions, such problems are hard (NP-complete, or worse). Some of the problems studied are the well-known team decision problem, the distributed hypothesis testing problem, as well as the problem of designing a communications protocol that guarantees the attainment of a prespecified goal with as little communications as possible. These results indicate the inherent difficulty of distributed decision making, even for very simple problems, with trivial centralized counterparts and suggest that optimally may be an elusive goal of distributed systems. Author (GRA)

N85-16675# Information Spectrum, Inc., Arlington, Va.
TECHNICAL PERFORMANCE MEASUREMENT HANDBOOK Final Report
T. B. Sears and E. P. Taylor 31 Jul. 1984 115 p
(Grant MDA903-82-G-0055)
(AD-A147314; ISII-V-4062-05) Avail: NTIS HC A06/MF A01 CSCL 05/1

TPM is defined as: the continuing prediction and demonstration of the degree of anticipated or actual achievement of selected technical objectives. Technical Performance Measurement (TPM) is an integral function of system engineering. For maximum utility, TPM must be compatible with other related program management activities (cost/schedule control system criteria, contract administration, production management, readiness functions). The function of this handbook is to provide program management personnel with insight into how technical performance is measured by the contractor, reported to the government and how this information can be effectively integrated with cost and schedule performance data. Chapters 2 and 3 provide overviews of TPM and C/SCSC taken from published documentation. Chapter 4 was developed using extensive interviews with engineering management personnel within government program offices and DOD contractors. It illustrates how technical, cost and schedule performance are actually being monitored and used to provide program control today. The differences between the government program office and the contractor viewpoints are highlighted. Chapter 5 identifies the issues which must be considered in PMO implementation and execution of a TPM program. Author (GRA)

N85-16676# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
FEASIBILITY OF MEASURING TECHNICAL PRODUCTIVITY IMPROVEMENTS IN AIR FORCE LOGISTICS COMMAND DEPOT-LEVEL MAINTENANCE USING THE DATA ENVELOPMENT ANALYSIS (DEA) AND CONSTRAINED FACET ANALYSIS (CFA) MODELS M.S. Thesis
R. E. Hitt, Jr. and R. F. Horace Sep. 1984 104 p
(AD-A147329; AFIT/GLM/LSM/84S-30) Avail: NTIS HC A06/MF A01 CSCL 13/8

In response to a Headquarters Air Force Logistics Command thesis proposal, this research demonstrated the feasibility of measuring technical productivity in a depot maintenance environment. Linear fractional programming techniques called Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) were used to show that the productivity of not-for-profit maintenance organizations can be reliably measured and directly supportive of management decision making. DEA/CFA analyses can measure multiple inputs and outputs simultaneously and display results in an easily understood format. This research stresses close cooperation between modelers and managers in selecting input/output variables so that information derived from the analysis can be used effectively. The results of this research were accepted by managers as accurate, simple and useful in their decision making. Additionally, DEA/CFA techniques appear to have a wide range of potential uses in many Air Force organizations where productivity, capacity and resource allocation analysis are needed. Author (GRA)

N85-16677# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AN APPRAISAL OF THE USAF TECHNOLOGY MODERNIZATION PROGRAM M.S. Thesis
G. J. S. Eskesen and J. J. Hockersmith Sep. 1984 131 p
(AD-A147344; AFIT/GLM/LSM/84S-18) Avail: NTIS HC A07/MF A01 CSCL 05/1

This thesis outlines the factors affecting the slowed productivity growth in the US with emphasis on DOD contractors. One of the primary causes of this phenomena is a reduction in investment for capital equipment. The Technology Modernization Program was designed to assist defense contractors in capital investment decisions. The contractors and the government are reporting large savings as a result of the Tech Mod program. This study is a look at the government's investments in the Aeronautical Systems Division's Tech Mod programs, the type of capital equipment being purchased by the contractors, and the government's management costs for the programs. The analysis of the government's investments, money and personnel, was made to determine the overall return on investment rate for a particular program. GRA

N85-16678# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
AN ANALYSIS OF THE EFFECT OF PROCESS CONTROLS ON PRODUCTIVITY AND WEAPON SYSTEM COSTS IN DOD PROCUREMENT M.S. Thesis
M. W. OMeara Sep. 1984 122 p
(AD-A147496; AD-F300490; AFIT/GLM/LSM/84S-50) Avail: NTIS HC A06/MF A01 CSCL 15/5

This thesis was a preliminary evaluation of the relationships among quality assurance process controls, productivity and weapon system costs. The available literature indicated positive relationships should exist among the three elements examined, but little empirical evidence was presented to support the positions of the authors. As a result, a detailed interview method was developed to describe the relationships that exist at major DoD aerospace facilities. On-site interviews were conducted at five randomly selected aerospace facilities identified as DoD Plant Representative Offices. The results of this initial study were inconclusive. The examined relationships appeared to be positive, but the cognizant DoD personnel had not validated the contractor data claiming increased productivity and reduced costs associated with adequate process controls. Recommendations are provided to improve the DoD surveillance methods. Originator-supplied keywords include: Acquisition/Procurement costs. GRA

N85-16679# Naval Postgraduate School, Monterey, Calif.
PRINCIPLES OF MULTIOBJECTIVE OPTIMIZATION
R. E. Rosenthal Aug. 1984 42 p
(AD-A147520; NPS55-84-016) Avail: NTIS HC A03/MF A01 CSCL 05/1

The purpose of this paper is to isolate and analyze the principal ideas of multiobjective optimization (multicriterion decision making) in management/operations research. This is done without casting recriminatory aspersions on single-objective optimization or championing any one multiobjective technique. The paper first attempts to define the problem, and then discusses the fundamental ideas, many of which stem from common sense. Each idea is examined for strengths and weaknesses and two-efficiency and utility-are shown worthy of extended consideration. In the light of this analysis some general recommendations are made. Besides offering the simple advice of not dismissing single-objective

optimization as a possible approach, we suggest that three broad classes of multiobjective techniques are very promising in terms of reliably and believably achieving a most preferred solution. These are: (1) partial generation of the efficient set, a rubric we use for unifying a wide spectrum of existing methods; (2) explicit utility maximization, a much overlooked approach combining multiattribute decision theory and mathematical programming and (3) implicit utility maximization, the name we use for the popular class of methods introduced by Geoffrion, Dyer and Feinberg and extended significantly by many others. GRA

N85-16680# Applied Science Associates, Inc., Valencia, Pa.
MODEL OF TEAM ORGANIZATION AND BEHAVIOR AND TEAM DESCRIPTION METHOD
J. Thomas Roth, Rohn J. Hritz, and Donald W. McGill Oct. 1984 243 p
(Contract MDA903-81-C-0198; DA Proj. 2Q2-63743-A-794)
(AD-A147540; ARI-RN-84-129) Avail: NTIS HC A11/MF A01 CSCL 05/10

This report describes a model of team organization and performance, and a method for describing the structures and behavior of teams. Both the model and description method were developed and validated through the field observation of Army teams performing selected team missions. The model is a set of concepts which are used to describe the formal and actual (mission) structure of teams and the behavior of teams and team members. The description method essentially provides a structured means of identifying, gathering, and verifying the data required to describe teams and team missions, using the concepts of the model. Originator-supplied keywords include: Teamwork, Team mission, Team description method, and Team modeling. GRA

N85-16681# Analytics, Inc., Dayton, Ohio.
EVALUATION OF THE EFFECTIVENESS OF THE WEIGHTED GUIDELINES TO INDUCE CONTRACTOR'S INVESTMENT IN COST REDUCING FACILITIES EQUIPMENT Final Report, Apr. 1983 - Aug. 1984
L. Kovich and T. McCann 15 Aug. 1984 62 p
(Grant MDA903-82-G-0053)
(AD-A147586; TR-1867-03) Avail: NTIS HC A04/MF A01 CSCL 15/5

The main objective of this report was to determine the adequacy of the present Weighted Guidelines profit policy for improving the productivity of defense contractors and to assess whether or not the profit policy is providing a stimulus for strengthening the industrial base. The scope of the analysis consisted of the following approach: (1) Reviewed literature of all material which pertained to the Weighted Guidelines profit policy which had been published since 1976; (2) Developed an investment model as the foundation to understanding the process of corporate capital investments; (3) Compared analyses and tests which were presented in Profit '76 and Profit '82. (4) Used Weighted Guidelines profit policy information gained through contacts within the Services and industry; (5) Performed analyses on financial information obtained from various government profit centers. GRA

N85-16682# General Accounting Office, Washington, D. C. National Security and International Affairs Div.
THE AIR FORCE CAN IMPROVE ITS FORECASTS OF AIRCRAFT SPARE PARTS REQUIREMENTS
19 Nov. 1984 27 p
(AD-A147911; GAO/NSIAD-85-2) Avail: NTIS HC A03/MF A01 CSCL 15/5

The Air Force forecasts its aircraft spare parts requirements by calculating a ratio of future flying hours to past flying hours for the aircraft using a specific part and then applying this ratio to the historical demand for the part. GAO found that the process resulted in overstated estimates for some parts and understand estimates for others because: (1) The computer file which identifies the aircraft on which the individual parts are used contained inaccurate data. (2) The requirements were not computed on the basis off all the unique combinations of aircraft which use each part. (3) The time period used in calculating the ratios does not correspond to the time needed to obtain the part. GAO makes recommendations designed to correct these problems and improve the Air Force's forecasting process for aircraft spare parts. GRA

N85-16683# Army Construction Engineering Research Lab., Champaign, Ill.
PROJECT MANAGER'S HANDBOOK FOR SPECIAL PROJECTS Final Report
J. G. Kirby Oct. 1984 79 p
(DA Proj. 4A1-62731-AT-41)
(AD-A147913; CERL-TR-P-85/01) Avail: NTIS HC A05/MF A01 CSCL 05/1

This report identifies unique problem areas that a manager of a Corps of Engineers construction project in a remote area is likely to encounter. The major problems identified from managers of past projects were: (1) procurement and purchasing, (2) planning and control, (3) engineering/design, (4) country-to-country agreement, (5) civilian personnel, (6) construction, (7) communications, (8) office/project manager operation, (9) Corps/contractor relations, and (10) transportation. Based on the results of questionnaires and meetings with former special project personnel, ways of solving or preventing these problems are proposed. It is recommended that the proposals presented in this report be used to supplement existing Corps guidance on special project management. GRA

N85-16684# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
GOVERNMENT CONTRACT CONTINGENT LIABILITIES. THE ANTI-DEFICIENCY ACT, AND THE HOBGOBLIN OF LITTLE MINDS M.S. Thesis George Washington Univ.
Stephen D. Hedlund Sep. 1984 197 p
(AD-A147919; AFIT/CI/NR-84-82T) Avail: NTIS HC A09/MF A01 CSCL 05/1

Contents: The Anti-Deficiency Act; (1) Overview of the Act; (2) Perceived Reasons for the Ineffectiveness of the Act; (3) Relevant Features and Applications of the Act; (4) What the Act means for Contingent Liabilities; The Problem of Statutory Authority in Contractually Assuming Contingent Risks; How the Government may Assume Contingent Obligations without Violating the Anti-Deficiency Act Contingencies in Fact; (1) Indemnity, (2) Clauses which may vary the Contract Price; (3) Constructive Changes and Differing Site Conditions; Termination Issues. GRA

N85-16685# RAND Corp., Santa Monica, Calif.
ESTIMATING WARTIME SUPPORT RESOURCE REQUIREMENTS. STATISTICAL AND RELATED POLICY ISSUES Interim Report
L. B. Embry Jul. 1984 111 p
(Contract F49620-82-C-0018)
(AD-A147923; RAND/N-2163-AF) Avail: NTIS HC A06/MF A01 CSCL 15/5

The Air Force spends several billion dollars annually to procure the spare parts and other resources need to support modern aircraft weapon systems. A large fraction of this investment is used to obtain assets for support of wartime operations. The assumptions used to project peacetime experience to wartime activity levels have important resource implications, but little has been done to test them empirically. Peacetime operational experiments, coupled with engineering projections of wartime failure rates, could be used to test these assumptions and provide an improved basis for resource requirements computations. This note addresses statistical and policy issues central to improving estimates of wartime support resource requirements. It uses the current problem of establishing the level of investment in spare engines for the C-5 aircraft to elucidate a number of these issues. The results should be of interest to policymakers concerned with logistics resource allocation, operational commanders whose wartime capabilities are affected by statistical assumptions and related policy decisions, and personnel responsible for producing requirements estimates. Originator-supplied keywords include: spare parts, failure, logistics planning, military aircraft and aircraft engines. GRA

N85-16686# Deutsche Lufthansa Aktiengesellschaft, Frankfurt am Main (West Germany).

[ACTIVITIES REPORT OF THE AEROSPACE INDUSTRY IN WEST GERMANY] Annual Report, 1982 [DEUTSCHE LUFTHANSA AKTIENGESELLSCHAFT GESCHAEFTSBERICHT 1982]
15 May 1983 64 p In GERMAN Original contains color illustrations
(ISSN-0722-3838) Avail: NTIS HC A04/MF A01

Balance sheet, project and loss account, comments on capital conservation, investment programs and technical progress, surveys by the supervisory and executive board, and Lufthansa group report are presented. Author (ESA)

N85-16687# Deutsche Lufthansa Aktiengesellschaft, Frankfurt am Main (West Germany).
[ACTIVITIES REPORT OF THE AEROSPACE INDUSTRY IN WEST GERMANY] Annual Report, 1983 [DEUTSCHE LUFTHANSA AKTIENGESELLSCHAFT GESCHAEFTSBERICHT 1983]
24 May 1984 69 p In GERMAN Original report contains color illustrations
(ISSN-0722-3838) Avail: NTIS HC A04/MF A01

The day to day operations and financial status of the Lufthansa group are reviewed. B.G.

N85-16688# National Bureau of Standards, Washington, D.C. Center for Building Technology.
NBS (NATIONAL BUREAU OF STANDARDS) DAYLIGHT AVAILABILITY DATABASE
S. Treado, G. Gillette, W. Remmert, and J. Bean Jul. 1984 55 p refs Sponsored in part by Navy, National Fenestration Council, Air Force and Army
(PB84-245745; NBSIR-84/2859) Avail: NTIS HC A04/MF A01 CSCL 05A

This report presents an annual database containing hourly measurements of solar radiation, illumination, sky luminance, and ambient air temperature. The measurements were made at the National Bureau of Standards, Gaithersburg, Maryland. Both instantaneous hourly and integrated average hourly measurements are included, as are daily, monthly and annual average and totals. For each measured quantity, a histogram of the distribution of the data is presented for the year. The data measurement, collection, and analysis system is described. This type of information is useful for determining energy requirements of buildings. Author (GRA)

82 DOCUMENTATION AND INFORMATION SCIENCE

Includes information storage and retrieval technology; micrography; and library science.

For computer documentation see *61 Computer Programming and Software.*

N85-16689# ZYCOR, Inc., Austin, Tex.
MANUAL AND AUTOMATED LINE GENERALIZATION AND FEATURE DISPLACEMENT: APPENDIXES Final Technical Report, Aug. 1982 - Jun. 1984
S. Zoraster, D. Davis, and M. Hugus Jun. 1984 92 p
(Contract DAAK70-82-C-0149)
(AD-A143251; Rept-101-43-16-APP; ETL-0359-1) Avail: NTIS HC A05/MF A01 CSCL 05/2

The primary objective of this effort was to examine map compilation techniques used for manual and automated line generalization and feature displacement. Manual techniques used at several Defense Mapping Agency compilation sites are described in detail. An extensive survey of algorithms suggested in the cartographic, image processing, and computer science literature is provided. Possible criteria for evaluating algorithm performance are discussed and line generalization algorithms are ranked according to certain of these measures. GRA

N85-16690# Ohio State Univ., Columbus. Dept. of Computer and Information Science.
DISTRIBUTED KNOWLEDGE BASE SYSTEMS FOR DIAGNOSIS AND INFORMATION RETRIEVAL Annual Report, 1 Jul. 1983 - 30 Jun. 1984
B. Chandrasekaran Aug. 1984 115 p
(Grant AF-AFOSR-0255-82)
(AD-A146890; AFOSR-84-0864TR) Avail: NTIS HC A06/MF A01 CSCL 09/2

During the year progress was made in a number of directions: (1) The investigators developed in significant detail a language for representing an agent's understanding of aspects of how a device works, and also developed a compiler which can produce a diagnostic expert problem solving system from this deep level functional representation. (2) The researchers continued their investigation of how design knowledge can be organized as plans and design problem solving can be viewed as design refinement by plan selection and redesign. They have completed the construction of a prototype design expert system called AIR-CYL, which designs a moderately complex mechanical component called an aircylinder for a range of specifications. (3) They continued investigation of high-level languages for expert system construction; in particular they have refined their design of the CSRL language for diagnostic expert system, and implemented it in Interlisp for the Xerox family of Lisp machines. (4) They have initiated a new investigation in reasoning about the behavior of physical systems by qualitative simulation by using a novel technique called consolidation, which infers the behavior of a composite component from the behaviors of its subcomponents. GRA

N85-16691# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
ORGANIZATIONS AND INFORMATION PROCESSING: A FIELD STUDY OF RESEARCH AND DEVELOPMENT UNITS WITHIN THE UNITED STATES AIR FORCE SYSTEMS COMMAND Ph.D. Thesis
T. Triscari, Jr. Aug. 1984 349 p
(AD-A147381; AFIT/CI/NR-84-68D) Avail: NTIS HC A15/MF A01 CSCL 05/1

This study conceptualizes the Research and Development (R&D) organizational unit as an information processing system which, to be most effective, must respond to the changing information requirements encountered in proceeding from a research orientation (information generation and expansion) to a product or system development emphasis (information application). To contend with and reduce the level of uncertainty, a unit must process information from various sources for its problem solving or decision making activities. This approach suggests that those units matching their information processing capabilities to the information processing requirements should be effective. The intent of this research is to investigate the information processing model of organizational design within an R&D setting. Specifically, the research will examine if perceived information requirements differ between research units and development units. GRA

N85-16692# Alabama Univ., Huntsville. Huntsville School of Engineering.
DATA BASE SUPPORT FOR SIO (SYSTEM INTEGRATION OFFICE) Final Technical Report, 25 Feb. 1983 - 30 Sep. 1984
J. D. Marr, L. Pritchett, and B. Wells Mar. 1984 27 p
(Contract DAAH01-82-D-A008)
(AD-A147487; AD-E950608; UAH-TR-83/11; DRSMI/RD-CR-84-19) Avail: NTIS HC A03/MF A01 CSCL 09/2

This activity was divided into two parts, data support and software development. Two S10 databases were supported; End of Run and Test Matrix. Enhancements to the FEASIL relational database system included plots, ADF restructuring, and formatted data output. Author (GRA)

N85-16693# Electronic Systems Div., Hanscom AFB, Mass.
EFFICIENT COMPUTATION OF OPTIMAL TIME FOR TRANSACTION PROCESSING IN A DATABASE SYSTEM Final Report
D. A. Varvel and W. Perrizo 31 Aug. 1984 26 p
(AD-A147568; ESD-TR-84-193) Avail: NTIS HC A03/MF A01

CSCL 12/1

Most database systems use locking for concurrency control. Responsiveness is degraded when transactions spend much time waiting for locks. In those situations in which the lockable units need not be processed in a particular order, differences in the order of processing can make large differences in the durations of the transactions, i.e., responsiveness. A backtracking or tree searching subprogram is used to determine the optimal order of processing. The subprogram uses an interesting method of tree pruning in order to perform the computation in reasonable time.
Author (GRA)

N85-16694# Air Force Human Resources Lab., Brooks AFB, Tex.
TECHNICAL ORDER MANAGERS HANDBOOK: UTILIZATION ASSESSMENT Final Report, Mar. 1983 - Mar. 1984
D. E. Blair Oct. 1984 20 p
(AF Proj. 9991)
(AD-A147579; AFHRL-SR-84-15) Avail: NTIS HC A02/MF A01 CSCL 05/1

This report provides a utilization assessment of the Air Force Technical Order (TO) Managers Handbook. The handbook was developed by the Air Force Human Resources Lab. to provide TO managers wtih guidelines for selection of the most appropriate format options and procurement of Air Force TOs. Although the primary user has been the Air Force Systems Command, the handbook has been distributed Air Force-wide to organizations having responsibilities for TO acquisition and management. A number of these organizations were contacted concerning their utilization of the handbook and the results indicated that the handbook is used as a quick reference source, especially for TO managers with limited experience. The handbook is also being used in the training environment where it has been a major source of information for the development of a formal TO acquisition and management course and is a useful tool for organizations that provide inhouse training. Whether the handbook is a guide for TO managers is debatable. A number of recommendations are provided for improving the content of the handbook and for maintaining its relevance when TO procedures, policies, and requirements change. Originator-supplied keywords include: research and development product utilization, technical order acquisition, technical order development, and technical order management. GRA

N85-16695# Department of the Air Force, Washington, D.C.
MATRIX DISPLAY SIMULATION Patent Application
G. G. Kuperman, inventor (to Air Force) Filed 14 Aug. 1984 43 p
(AD-D011371; US-Patent-Appl-SN-640624) Avail: NTIS HC A03/MF A01 CSCL 05/2

Document describes a system for simulating the display of visual images by a matrix of liquid crystal cells or other matrix elements and providing flexibility in selecting display characteristics such as element size, active area ratio, and signal noise content. The display preferably employs a cathode ray tube and uses software signal processing. Author (GRA)

N85-16696# Electronic Systems Div., Hanscom AFB, Mass.
A SIMULATOR FOR DETERMINING THE PERFORMANCE OF TRANSACTION MANAGER AND LOCK MANAGER COMBINATIONS IN A DATABASE Final Report
D. A. Varvel and W. Perrizo 31 Aug. 1984 47 p
(AD-A147827; ESD-TR-84-195) Avail: NTIS HC A03/MF A01 CSCL 09/2

Most database systems use locking for concurrency control. Responsiveness is degraded when transactions spend much time waiting for locks. In those situations in which the lockable units need not be processed in a particular order, differences in the order of processing can make large differences in the durations of the transactions, i.e., responsiveness. Order of processing may be modified by the use of a combination of non-blocking and potentially-blocking lock requests. A simulation is used to investigate the performance of several such algorithms in a variety of settings. GRA

83 ECONOMICS AND COST ANALYSIS

Includes cost effectiveness studies.

N85-15792# Office of Technology Assessment, Washington, D.C.
FINANCING CONSIDERATIONS AND FEDERAL BUDGET IMPACTS
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 217-226 refs (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

N85-16371# National Inst. of Meteorology, Brasilia (Brazil).
THE POTENTIAL CONTRIBUTIONS OF THE WORLD CLIMATE PROGRAM (WCP) TO THE ECONOMIES OF DEVELOPING COUNTRIES
Fernando Pimenta Alves *In* WMO Climate Conf. for Latin America and the Caribbean 1984 p 339-356 refs In SPANISH; ENGLISH summary (For primary document see N85-16352 07-47)
Avail: NTIS MF A01; print copy available at WMO, Geneva SWFR65

84 LAW AND POLITICAL SCIENCE

Includes space law; international law; international cooperation; and patent policy.

N85-16697*# National Aeronautics and Space Administration, Washington, D. C.
OUTER SPACE LAW: A PROBLEM OF ASTRONAUTICS
Vladimir Mandl Dec. 1984 55 p Transl. into ENGLISH of "Das weltraum-recht. Ein problem der raumfahrt" Rept. Germany, 1983 48 p Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-4005)
(NASA-TM-77760; NAS 1.15:77760) Avail: NTIS HC A04/MF A01 CSCL 05D

The theory of space law is discussed from the point of view of similarities and differences between hypothetical space law and current (1932) aviation law. International legal aspects and economic and cultural effects are also addressed. Author

N85-15791# Office of Technology Assessment, Washington, D.C.
TITLE 2: NATIONAL COMMISSION ON SPACE (PUBLIC LAW 98-361)
In its Civilian Space Stations and the US Future in Space Nov. 1984 p 214-216 (For primary document see N85-15781 07-18)
Avail: SOD HC $7.50

85 URBAN TECHNOLOGY AND TRANSPORTATION

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

N85-16698*# General Electric Co., Philadelphia, Pa. Advanced Energy Programs Dept.
TRANSFORMATION TOUGHENED CERAMICS FOR THE HEAVY DUTY DIESEL ENGINE TECHNOLOGY PROGRAM Final Report
S. Musikant, E. Feingold, H. Rauch, and S. Samanta Oct. 1984 34 p refs
(Contracts DEN3-339; DE-AI01-80CS-5019)
(NASA-CR-174689; DOE/NASA/0339-1; NAS 1.26:174689) Avail: NTIS HC A03/MF A01 CSCL 13F

The objective of this program is to develop an advanced high temperature oxide structural ceramic for application to the heavy duty diesel engine. The approach is to employ transformation toughening by additions of ZrO.5HfO.5O2 solid solution to the oxide ceramics, mullite (2Al2O3S2SiO2) and alumina (Al2O3). The study is planned for three phases, each 12 months in duration. This report covers Phase 1. During this period, processing techniques were developed to incorporate the ZrO.5HfO.5O2 solid solution in the matrices while retaining the necessary metastable tetragonal phase. Modulus of rupture and of elasticity, coefficient of thermal expansion, fracture toughness by indent technique and thermal diffusivity of representative specimens were measured. In Phase 2, the process will be improved to provide higher mechanical strength and to define the techniques for scale up to component size. In Phase 3, full scale component prototypes will be fabricated. Author

N85-16699*# Integral Technologies, Inc., Westmont, Ill.
METHODS FOR HEAT TRANSFER AND TEMPERATURE FIELD ANALYSIS OF THE INSULATED DIESEL Interim Report
Thomas Morel, Paul N. Blumberg, Edward F. Fort, and Rifat Keribar Aug. 1984 274 p refs
(Contracts DEN3-342; DE-AI01-80CS-50194)
(NASA-CR-174783; DOE/NASA/0342-1; NAS 1.26:174783) Avail: NTIS HC A12/MF A01 CSCL 13F

Work done during phase 1 of a three-year program aimed at developing a comprehensive heat transfer and thermal analysis methodology oriented specifically to the design requirements of insulated diesel engines is reported. The technology developed in this program makes possible a quantitative analysis of the low heat rejection concept. The program is comprehensive in that it addresses all the heat transfer issues that are critical to the successful development of the low heat rejection diesel engine: (1) in-cylinder convective and radiative heat transfer; (2) cyclic transient heat transfer in thin solid layers at component surfaces adjacent to the combustion chamber; and (3) steady-state heat conduction in the overall engine structure. The Integral Technologies, Inc. (ITI) program is comprised of a set of integrated analytical and experimental tasks. A detailed review of the ITI program approach is provided, including the technical issues which underlie it and a summay of the methods that were developed. R.S.F.

88 SPACE SCIENCES (GENERAL)

N85-16700# European Space Agency, Paris (France).
QUASAT: A VLBI OBSERVATORY IN SPACE
W. R. Burke, comp. Sep. 1984 202 p refs Proc. of Workshop held at Gross Enzersdorf, Austria; sponsored by European Science Foundation, USA National Academy of Sciences, ESA, NASA and Austrian Solar and Space Agency Original contains color illustrations
(ESA-SP-213; ISSN-0379-6566) Avail: NTIS HC A10/MF A01

The use of a very long base interferometry satellite to study active galactic nuclei, including the phenomenon of superluminal motion, the formation of jets of relativistic plasma, and structures at the scale of the optical broad emission line region; galactic stellar objects and interstellar masers; the multiphase interstellar medium, intercluster medium and intergalactic medium; and the distribution of dark matter in the universe was discussed. Use of extragalactic H2O masers for direct measurement of the distances of galaxies up to 10 Mpc was considered. For individual titles, see N85-16701 through N85-16723.

N85-16701# Sterrewacht, Leiden (Netherlands).
COSMOLOGY **c90**
H. vanderLaan *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 3-6 refs (For primary document see N85-16700 07-88) Avail: NTIS HC A10/MF A01

The observational astronomy basis for cosmology is reviewed. Efforts to determine the Hubble expansion rate, the deceleration parameter, density, the cosmological constant, and the mean random velocity of galaxies are discussed. For astronomers the homogeneous, isotropic world models of Friedmann still serve. The observational characteristics of the microwave background confirm the models' empirical worth. Microwave radiation enables physicists to describe the early epochs of the universe, the first minutes to 10 to the minus 43 sec. Superclusters may contain the key to the problems separating these two domains. Populations of strong radio sources provide the most direct and pronounced evidence for astrophysical evolution. Author (ESA)

N85-16702# Cambridge Univ. (England). Dept. of Astronomy.
SOME ASPECTS OF ACTIVE GALACTIC NUCLEI **c90**
A. C. Fabian *In* ESA QUASAT: A VLBI Obs. in Space Aug. 1984 p 7-9 refs (For primary document see N85-16700 07-88) Avail: NTIS HC A10/MF A01

The observational properties of active galaxies are described, weaknesses of theoretical models for the central engine are reviewed, and the contribution of the QUASAT satellite to their study is assessed. The large kinetic power inferred in jets issuing from active galaxies which can exceed that in the photon luminosity, is not readily explained by the simple picture of an accreting black hole. Direct imaging offers an excellent opportunity for finding out the shape of active galactic nuclei: QUASAT can give information on radio structures at the scale where most of the optical and ultraviolet line radiation originates, on the collimation of jets, and on the statistics of active galaxies. Author (ESA)

N85-16703# Johns Hopkins Univ., Baltimore, Md.
THE GALAXY SCENE AND QUASAT **c90**
Colin A. Norman *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 11-12 refs (For primary document see N85-16700 07-88) Avail: NTIS HC A10/MF A01

Milky Way galaxy research relevant to the QUASAT project is reviewed. The structure of the interstellar medium, the dynamics of the bulge and halo and associated dark material; activity manifest in the galactic center stellar coronas and galactic jets; and star formation are discussed. Author (ESA)

N85-16704# Netherlands Foundation for Radio Astronomy, Dwingelo.
THE QUASAT MISSION: AN OVERVIEW **c90**
R. T. Schilizzi, B. F. Burke (Massachusetts Inst. of Tech., Cambridge), J. F. Jordan (Jet Propulsion Lab., California Inst. of Tech., Pasadena, Calif.), and A. Hawkyard (European Space Technology Center, Noordwijk, Netherlands) *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 13-18 ref (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The QUASAT VLBI mission to provide images of the total intensity and polarized emission of compact radio sources in continuum and line with a combination of angular resolution and quality unattainable from Earth is summarized. The astrophysical goals encompass the study of active nuclei at scales appropriate to the outer reaches of accretion disks and the optical broad and narrow line regions; the study of galactic continuum sources in stars and in the galactic center; and spectroscopic studies of galactic and extragalactic molecular masers to determine their role in the life cycle of stars, and their use as direct distance indicators. Author (ESA)

N85-16705# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
SOME PROSPECTS OF SPACE VLBI **c89**
R. Z. Sagdeev *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 19-21 refs (For primary document see N85-16700 07-88) Avail: NTIS HC A10/MF A01

Ground-space very long base interferometry projects with a low-orbit space telescope (very complete coverage of u, v-plane) and with a high orbit space telescope (very good angular resolution) are summarized. The radioastronomic cosmic system aperture synthesis experiment uses a 500 km orbit 30 m radio

telescope and a 70 m ground antenna to study the spatial diffraction image caused by the scattering of radio waves from point sources in the interstellar medium for the production of parameters of the medium and sources (spectrum of electron density fluctuations, velocity of inhomogeneity motion, sizes and velocity of pulsar motion). A 1 million km apogee 10 m telescope to study pulsars and synchrotron radiation sources is proposed. Author (ESA)

N85-16706# European Space Agency, Paris (France).
QUASAT: TECHNICAL ASPECTS OF THE PROPOSED MISSION c89
In its QUASAT: A VLBI Obs. in Space Sep. 1984 p 27-95 (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The mission characteristics of the QUASAT VLBI satellite; the radio astronomy radio frequency subsystems; the ESA and NASA flight system configurations; and ground system requirements are described. The mission is designed to provide images of the total intensity and polarized emission of compact radio sources. The radio astromony subsystems include the feed assembly, low-noise preamplifiers, a downconverter intermediate amplifier assembly, and a data formatter. The ESA proposal is based on a 20 m rigid inflatable antenna. The NASA proposal is based on existing technology for a 15 m deployable antenna. Full uv-plane coverage requires six ground stations with two-way X or Ku band links, and possibly a five band downlink. Author (ESA)

N85-16707# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
A STUDY ON THE IMAGING POTENTIAL OF QUASAT c89
A. C. S. Readhead, R. A. Preston, D. L. Meier, R. P. Linfield, C. R. Lawrence, V. Dhawan (Massachusetts Inst. of Tech., Cambridge), R. S. Simon (Hulbert (E.O.) Center for Space Research), P. N. Wilkinson (Nuffield Radio Astronomy Labs.), S. Bolton, B. F. Burke (Massachusetts Inst. of Tech., Cambridge) et al *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 101-110 (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The orbit, ground array, and sensitivities of the space and ground systems of the QUASAT spaceborne astronomy mission were studied. Parameters which yield images in which the noise is within a factor of three of the thermal noise limit were derived. With a very large ground array QUASAT should produce images as complex as the best of the VLA. At 22 GHz the resolution will be 0.1 milliarcsec, the field of view 15 milliarcsec, and it will be possible to make noise limited maps of complex objects. The QUASAT is essential for mapping southern declination objects. Without QUASAT, even the simple core-jet source cannot be mapped at declination minus 60 deg. It will be possible with QUASAT to make maps with observing times as short as 6 hr although the very best maps will require 48 hr observations.
Author (ESA)

N85-16708# National Radio Astronomy Observatory, Charlottesville, Va.
POTENTIAL AFFILIATE STATIONS TO WORK WITH THE EVN c14
P. N. Wilkinson *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 111-113 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

Extension of the European VLBI Network (EVN)-QUASAT coverage of the u,v plane by adding ground stations was studied. With the addition of 2 or more existing or planned affiliate antenna EVN-based ground arrays could produce 22 GHz maps of higher (> 30 deg) declination sources competitive with those from VLBA. Haystack and Owens Valley are excellent sites for augmenting the EVN and Green Bank and Samarkand would provide useful additional information. If the four-element Canadian array is built it would be the obvious partner for the EVN for higher declination sources. For sources near the celestial equator, however, more southerly affiliates are needed. Adding Hartebeesthoek and one or more intermediate sites provides coverage similar to that obtained with the VLBA, but these antennas either do not exist or, in Hartebeesthoek's case, are not capable of 22 GHz operation. Author (ESA)

N85-16709# Brandeis Univ., Waltham, Mass. Dept. of Physics.
CORRELATOR AND DATA PROCESSING REQUIREMENTS FOR QUASAT c61
David H. Roberts *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 115-118 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

Factors affecting the performance of the QUASAT spaceborne VLBI antenna correlator and data processing systems are discussed. The large orbit and rapid motion of the satellite lead to delays, delay rates, fringe rates, fringe accelerations, and Doppler bandshifts substantially greater than those encountered with ground-based antennas alone. Updating of the Mark 3 correlator, or small modifications to the planned very long baseline array correlator, will enable the direct processing of QUASAT data. The modest aperture of the QUASAT antenna and the rapid motion of its baselines through the u-v plane limit the space-ground sensitivity of the interferometer, so special techniques may be required to recover those fringes. Author (ESA)

N85-16710# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
LIMITATION OF VLBI ANGULAR RESOLUTION c32
L. I. Matveyenko *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 119-121 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The effects of scattering and interferometer sensitivity on VLBI angular resolution are summarized. Atmospheric, interplanetary, and interstellar scattering, and scattering due to the envelope of the object limit the baseline maximum length for 1 cm waves to 1 million km; for metric waves it is < several thousand km. For centimeter waves, sensitivity limits baselines to 100,000 km, with approximately 40 microarcsec angular resolution. Author (ESA)

N85-16711# Academy of Sciences (USSR), Moscow. Inst. for Space Research.
PROCESSING SYSTEM FOR SPACE VLBI c61
S. V. Pogrebenko, M. V. Popov, and G. S. Tzarevsky *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 123-125 ref (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The main characteristics of the ground/space VLBI preliminary data processing (PDP) system are derived from consideration of the assumed values of delay and fringe rate and their expected errors. The PDP system has to compensate for the long delay (as much as several megabits) that occurs when communication satellites are used. The PDP system must also compensate for large fringe rates of up to several hundred kilohertz. The sampling rate of the correlator output must be as high as several tens per second. Because of this high correlator output sampling rate, a special Fourier processor must be used when on-line reduction is desired. A PDP system that takes account of these requirements is introduced. Operating in Mark 2 format, the PDP system makes it possible to compensate the fringe rate up to 500 kHz and has a sampling time for the correlator output equal to 8 msec. Author (ESA)

N85-16712# Sterrewacht, Leiden (Netherlands).
THE ENVIRONMENT OF ACTIVE GALACTIC NUCLEI c90
George Miley *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 131-137 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

It is shown that the radio-emitting relativistic plasma and thermal gas in the broad line region of active galactic nuclei interact with each other. The detailed effects produced in the radio and optical spectroscopy by such interactions on a larger scale are described, and it is concluded that parsec-scale interactions produce similar

effects observable with QUASAT. For such studies a highly elliptical satellite orbit is preferred. Author (ESA)

N85-16713# California Inst. of Tech., Pasadena.
THE COMPACT RADIO EMISSION REGIONS IN ACTIVE GALACTIC NUCLEI **c93**
A. C. S. Readhead *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 139-145 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The state of VLBI observations of active nuclei is reviewed and the expcted impact of QUASAT is discussed. The most powerful extragalactic objects, radio souces are divided into three main classes according to morphology and spectral index, viz. extended steep spectrum objects, in which the central galaxy is straddled by two large lobes of emission; compact steep spctrum objects; and compact flat spectrum objects. It is shown that three are very compact, unresolved features in the central core of all three classes. Observations with QUASAT could probe objects on interesting physical scales down to 10 to the 17th power cm. In particular QUASAT will be ideal or studying superluminal sources, and other variable objects, and it may enable detailed study of the formation and propagation of relativistic shocks in active nuclei. Author (ESA)

N85-16714# Mullard Radio Astronomy Observatory, Cambridge (England).
TESTING THEORIES OF SUPERLUMINAL MOTION **c90**
P. A. G. Scheuer *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 149-151 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

Relativistic beaming, so-called Christmas tree, gravitational lens, and noncosmological red shift theories of superluminal motion are reviewed. The impact of QUASAT in tests of relativistic beaming theories is discussed. The QUASAT will be able to resolve, and measure motions in, sources of one to a few hundred millijanskys, whose jets are too short to be resolved with Earth-based VLBI. It can help to resolve such jets by the 3:1 increase in baseline; and by improved dynamic range, which makes the jet observable over a larger number of milliarcsec. Author (ESA)

N85-16715# Massachusetts Inst. of Tech., Cambridge.
QUASAT, GRAVITATIONAL LENSES, AND STUDIES OF THE INTERSTELLAR, INTRACLUSTER AND INTERGALACTIC MEDIUM **c90**
B. F. Burke *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 153-155 (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The use of the QUASAT VLBI satellite to study the refractive effects of the interstellar medium (ISM), the intracluster medium (ICM), and the intergalactic medium (IGM) is discussed. These effects are related to the study of multiply-imaged quasars subjected to gravitational lensing, since refractive effects are imposed by intervening matter along the ray paths from the original objects. The methods of VLBI are relevant since the effects are primarily manifest on the milliarcsec angular scale and finer. Studies with QUASAT will open areas of study of the ISM, ICM, and IGM themselves, with implications for matter distribution on galactic scales and larger. The studies are linked to problems of active and galactic nuclei, and active stars such as X-ray binaries and SS433 objects. Author (ESA)

N85-16716# Max-Planck-Inst. fuer Radioastronomie, Bonn (West Germany).
VERY LONG BASE INTERFEROMETRY (VLBI) IN SPACE AND X-RAY OBSERVATIONS OF COMPACT SOURCES IN ACTIVE GALACTIC NUCLEI **c93**
Peter Biermann *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 157-159 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The combination of very high resolution radio data with X-ray data to study active galactic nuclei is discussed. Very compact emission in radio and mm wavelengths comes from self-absorbed synchrotron emission limited by inverse Compton emission in X-rays. This limit translates into a brightness temperature limit of 10 to the 12th power K. Sources near this brightness temperature require high spatial resolution and baselines larger than the diameter of the Earth. Hence to test the limit requires QUASAT. A more precise test can be made by comparing predicted and observed X-ray flux densities from the inverse Compton emission. This requires X-ray flux densities and X-ray spectra, e.g., from the EINSTEIN data bank and from EXOSAT. The X-ray surveys of the X-ray satellite ROSAT with sensitivities reaching 1 .2 nJy (at 1 keV) in the deep survey will provide the best match for space VLBI from QUASAT. Author (ESA)

N85-16717# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
THE WIDE-RANGE SPACE RADIO INTERFEROMETER **c35**
V. V. Andrejanov, L. I. Gurvits, N. S. Kardashev, S. V. Pogrebenko, V. A. Rudakov, R. Z. Sagdeev, and G. S. Tsarevsky *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 161-164 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

A high orbit wideband space radiointerferometer is proposed. It is shown that observations in octave (or more) wavelength range spread UV-plane coverage. Problems of image restoration in the wideband space aperture synthesis system are considered. Author (ESA)

N85-16718# Domaine Univ., Saint Martin d Heres (France). Inst. de Radio Astronomie Millimetrique.
THE RELEVANCE OF QUASAT TO THE STAR FORMATION PROBLEM **c90**
D. Downes and D. T. Emerson *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 165-170 refs Original contains color illustrations (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The use of QUASAT to study H2O masers emitting at millimeter or submillimeter wavelengths from the contracting envelopes of protostellar objects is discussed. Masers may delineate the remnants of disks or filaments from which the star condensed. The H2O masers show the flow zones, collimated by the disks, and are presumably small, high density concentrations, either in the wind itself, or where the wind smashes into stationary, ambient material. The QUASAT baselines are two to five times longer than those in many VLBI maser studies, allowing advances in the mapping of these objects and in the measurement of their proper motions. The positional accuracy will not improve a full factor of five, as the increase in baseline is partially offset by the higher receiver temperature and the smaller collecting area than used in most maser proper motion studies. Its main benefit may be greatly improved coverage. Author (ESA)

N85-16719# Onsala Space Observatory (Sweden).
GALACTIC OH AND H2O MASERS **c93**
R. S. Booth *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 171-178 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

The properties of galactic OH and H2O masers in regions of star formation and associated with evolved stars are described. For both types it is clear that resolution and mapping capabilities of the QUASAT mission can be used to good effect. The problem of interstellar scattering is discussed. It should not impose serious constraints on the study of OH and H2O masers. On the contrary, the masers may be used to study the scattering law. Author (ESA)

N85-16720# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
WATER MASER OUTBURST **c93**
L. I. Matveyenko *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 179-180 refs (For primary document see N85-16700 07-88)

Avail: NTIS HC A10/MF A01

A powerful H2O maser outburst was observed in the Orion Nebula in August-September 1979. Flux density reached > 2 million Jy; component velocity = 8 km/sec. The line profile is asymmetric and time variable. The outburst region has components located along the direction minus 50 deg. Line width depends on the emission region size-differential velocity and, under the assumption of a point source, corresponds to a 7 kHz line width. This is evidence of the low temperature of a maser cloud, < 60 K. The line emission is mainly from its central region the size of which is 1 mas, i.e., 0.5 AU and the brightness temperature = 10 to the 16th power K. The intricate fine structure of the profile suggests the presence of compact components within the region, which are 0.1 AU and whose brightness temperature is 10 to the 17th power K. A high angular resolution, e.g., QUASAT VLBI satellite, study is required to understand the outbursts. Author (ESA)

N85-16721# Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

WATER MASERS AND DISTANCE MEASUREMENTS: THE IMPACT OF QUASAT c17

Mark J. Reid *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 181-184 refs (For primary document see N85-16700 07-88)

Avail: NTIS HC A10/MF A01

A spaceborne VLBI station to characterize complex structures of H2O masers in the Milky Way, not resolvable from Earth, is proposed. The QUASAT satellite measurements could extend knowledge of the maser process by providing greatly increased resolution. Recent VLBI observations of the proper motions of H2O masers were used to determine distances to the sources. The increased angular resolution of QUASAT could be useful to increase the accuracy of the measurements and possibly to allow direct distance measurements to other galaxies. Author (ESA)

N85-16722# Shanghai Observatory (China).

A SHORT NOTE ON THE HIGH PRECISION NAVIGATION OF QUASAT c89

Tang Guoqiang *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 185-186 (For primary document see N85-16700 07-88)

Avail: NTIS HC A10/MF A01

The use of fringe tracking to assure the high precision navigation required for astrometric, astronomical and geodynamic applications of QUASAT VLBI data is proposed. No additional onboard equipment is needed, since the method is based on postprocessing of fringe phase and rate. High accuracy fringe detection hardware and software are needed, along with continuous interferometric observation between spacecraft and ground stations, and near real time correlating. Position accuracy could be within 10 cm at 22GHz, 40 cm at 5 GHz and 125 cm at 1.6 GHz, if a high accuracy dynamic spacecraft model is used.

Author (ESA)

N85-16723# Hulburt (E. O.) Center for Space Research, Washington, D.C.

OPPORTUNITIES FOR HIGH ANGULAR AND TEMPORAL RESOLUTIONS OF GALACTIC OBJECTS AT RADIO FREQUENCIES c89

Kenneth J. Johnston *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 187-189 refs (For primary document see N85-16700 07-88)

Avail: NTIS HC A10/MF A01

The use of QUASAT satellite VLBI data for studies of galactic objects, nearby flaring stars, collapsed stellar objects with accretion disks, the interstellar medium, and pulsars is discussed. Temporal resolutions of milliseconds for solar emission, minutes for nearby flaring stars and hours for collapsed stellar objects is necessary. The sensitivity of QUASAT should be maximized to allow the maximum number of galactic objects to be studied. The mission will study solar flaring emission scales of 700 km, nearby stars at resolutions of a fraction of the stellar disks, and collapsed objects at resolutions of the stellar systems, to yield an understanding of plasma gyrosynchrotron emission on the Sun and nearby stars, and synchrotron emission from disks of collapsed objects. The baselines available to QUASAT are comparable to the diffraction pattern size scales of the interstellar medium. Experiments using QUASAT will contribute to understanding of the velocity and structure of the interstellar medium. Author (ESA)

89 ASTRONOMY

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

N85-16724*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SIRTF: THE NEXT STEP

Frederic C. Gillett (Kitt Peak National Observatory) and Michael W. Werner Dec. 1984 19 p refs

(NASA-TM-86663; Rept-85053; NAS 1.15:86663) Avail: NTIS HC A02/MF A01 CSCL 03A

The scientific and technical background and prospects for the space infrared telescope facility (SIRTF) are described. This facility is a superfluid-helium-cooled, 0.85-meter infrared telescope to be placed in orbit in 1993. It is designed to carry out photometry over the wavelength range 2 to 700 micrometers, and diffraction-limited imagery in either broad or narrow spectral bands over the range 1.8 to 200 micrometers. It is proposed that SIRTF measure spectra in the range 2.5 to 200 micrometers with resolving power between 50 and 1000 and that the focal plane contain about 20,000 detector elements, both discrete and in arrays. The SIRTF observatory is designed to be a long-lived facility providing opportunities for general investigations by the entire scientific community. For following up the all-sky survey carried out by the Infrared Astronomical Satellite (IRAS), SIRTF is ideal. It can do a deep survey to flux levels 5000 times fainer than IRAS and can obtain spectra of even the faintest IRAS sources. R.S.F.

N85-16136*# Virginia Univ., Charlottesville. Dept. of Astronomy.

ASTROMETRIC APPLICATIONS OF THE MT. STROMLO PDS 1010A

Philip A. Ianna *In* Royal Observatory Astron. Phot. 1984 1984 p 301-310 refs (For primary document see N85-16102 07-35)

(Contract JPL-956230; Grant NSF AST-82-00232)

Avail: NTIS HC A15/MF A01 CSCL 14B

N85-16137# Sterrewacht, Leiden (Netherlands).

AUTOMATED STAR COUNTS IN NEBULOUS AREAS

C. P. deVries *In* Royal Observatory Astron. Phot. 1984 1984 p 311-319 refs (For primary document see N85-16102 07-35)

Avail: NTIS HC A15/MF A01

N85-16705# Academy of Sciences (USSR), Moscow. Inst. of Space Research.

SOME PROSPECTS OF SPACE VLBI

R. Z. Sagdeev *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 19-21 refs (For primary document see N85-16700 07-88)

Avail: NTIS HC A10/MF A01

N85-16706# European Space Agency, Paris (France).

QUASAT: TECHNICAL ASPECTS OF THE PROPOSED MISSION

In its QUASAT: A VLBI Obs. in Space Sep. 1984 p 27-95 (For primary document see N85-16700 07-88)

Avail: NTIS HC A10/MF A01

N85-16707# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

A STUDY ON THE IMAGING POTENTIAL OF QUASAT

A. C. S. Readhead, R. A. Preston, D. L. Meier, R. P. Linfield, C. R. Lawrence, V. Dhawan (Massachusetts Inst. of Tech., Cambridge), R. S. Simon (Hulbert (E.O.) Center for Space Research), P. N. Wilkinson (Nuffield Radio Astronomy Labs.), S. Bolton, B. F. Burke (Massachusetts Inst. of Tech., Cambridge) et al *In* ESA

QUASAT: A VLBI Obs. in Space Sep. 1984 p 101-110 (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16722# Shanghai Observatory (China).
A SHORT NOTE ON THE HIGH PRECISION NAVIGATION OF QUASAT
Tang Guoqiang *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 185-186 (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16723# Hulburt (E. O.) Center for Space Research, Washington, D.C.
OPPORTUNITIES FOR HIGH ANGULAR AND TEMPORAL RESOLUTIONS OF GALACTIC OBJECTS AT RADIO FREQUENCIES
Kenneth J. Johnston *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 187-189 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

90 ASTROPHYSICS

Includes cosmology; and interstellar and interplanetary gases and dust.

N85-16725# Observatoire de Paris-Meudon (France). Lab. d'Astronomie Infrarouge.
THE ABUNDANCE OF DEUTERIUM IN THE OUTER SOLAR SYSTEM FROM GROUND-BASED MEASUREMENTS OF MONODEUTERATED METHANE
C. deBergh, B. L. Lutz (Lowell Observatory), and T. Owen (New York Univ., Stony Brook) 1984 6 p refs Presented at the Intern. Conf. on Isotopic Ratios in the Solar System, Paris, 19-22 Jun. 1984
Avail: NTIS HC A02/MF A01

CH3D, absorptions were detected in spectra of Saturn, Uranus and Titan recorded near 1.6 microns with the Fourier transform spectrometer at the 4m telescope of Kitt Peak National Observatory. Preliminary results of our measurements of the CH3D/CH4 ratio in the atmospheres of these two giant planets and of the satellite Titan are presented. Author

N85-16701# Sterrewacht, Leiden (Netherlands).
COSMOLOGY
H. vanderLaan *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 3-6 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16702# Cambridge Univ. (England). Dept. of Astronomy.
SOME ASPECTS OF ACTIVE GALACTIC NUCLEI
A. C. Fabian *In* ESA QUASAT: A VLBI Obs. in Space Aug. 1984 p 7-9 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16703# Johns Hopkins Univ., Baltimore, Md.
THE GALAXY SCENE AND QUASAT
Colin A. Norman *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 11-12 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16704# Netherlands Foundation for Radio Astronomy, Dwingelo.
THE QUASAT MISSION: AN OVERVIEW
R. T. Schilizzi, B. F. Burke (Massachusetts Inst. of Tech., Cambridge), J. F. Jordan (Jet Propulsion Lab., California Inst. of Tech., Pasadena, Calif.), and A. Hawkyard (European Space Technology Center, Noordwijk, Netherlands) *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 13-18 ref (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16712# Sterrewacht, Leiden (Netherlands).
THE ENVIRONMENT OF ACTIVE GALACTIC NUCLEI
George Miley *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 131-137 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16714# Mullard Radio Astronomy Observatory, Cambridge (England).
TESTING THEORIES OF SUPERLUMINAL MOTION
P. A. G. Scheuer *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 149-151 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16715# Massachusetts Inst. of Tech., Cambridge.
QUASAT, GRAVITATIONAL LENSES, AND STUDIES OF THE INTERSTELLAR, INTRACLUSTER AND INTERGALACTIC MEDIUM
B. F. Burke *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 153-155 (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16718# Domaine Univ., Saint Martin d Heres (France). Inst. de Radio Astronomie Millimetrique.
THE RELEVANCE OF QUASAT TO THE STAR FORMATION PROBLEM
D. Downes and D. T. Emerson *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 165-170 refs Original contains color illustrations (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

91 LUNAR AND PLANETARY EXPLORATION

Includes planetology; and manned and unmanned flights.
For spacecraft design see *18 Spacecraft Design Testing, and Performance*. For space stations see *15 Launch Vehicles and Space Vehicles*.

No abstracts in this category.

92 SOLAR PHYSICS

Includes solar activity, solar flares, solar radiation and sunspots.

N85-16726*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
POLAR RAIN: SOLAR CORONAL ELECTRONS IN THE EARTH'S MAGNETOSPHERE
D. H. Fairfield and J. D. Scudder Dec. 1984 60 p refs (NASA-TM-86150; NAS 1.15:86150) Avail: NTIS HC A04/MF A01 CSCL 03B

Low energy electron measurements collected by ISEE 1 reveal the frequent presence of field-aligned fluxes of few hundred eV electrons in he geomagnetic tail lobes. In the northern tail lobe these electrons are most prominent when the interplanetary magnetic field is directed away from the Sun. This characteristic helps identify the electrons as polar rain electrons. By mapping the tail lobe velocity distribution function into the solar wind, previous suggestions that the polar rain is indeed of solar wind origin and is due to the access of electrons to the magnetotail lobe were confirmed. It was demonstrated that the moe energetic component of the polar rain is composed of electrons from the solar wind strahl - a field-aligned component of the solar wind which is difficult to measure but which is thought to be caused by

the collisionless transit of hundred eV electrons from the inner solar corona to 1 AU. R.S.F.

N85-16727# Stanford Univ., Calif. Center for Space Science and Astrophysics.
SPICULES AND SURGES
M. L. Blake and P. A. Sturrock 27 Apr. 1984 42 p
(Contract N00014-75-C-0673)
(AD-A146785) Avail: NTIS HC A03/MF A01 CSCL 03/2

It is argued that spicules, macrospicules and surges are manifestations of the same phenomenon occurring on different scales. A mechanism that can be successfully applied to explain the phenomenon on all three scales is sought. GRA

93 SPACE RADIATION

Includes cosmic radiation; and inner and outer Earth's radiation belts.

For biological effects of radiation see *52 Aerospace Medicine*. For theory see *73 Nuclear and High-Energy Physics*.

N85-16728*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THE (20)Ne INTERACTION IN EXTENDED MATTER
John W. Wilson, Lawrence W. Townsend, Mervyn Wong (California Univ., Berkeley. Lawrence Berkeley Lab.), and Walter Schimmerling (California Univ., Berkeley. Lawrence Berkeley Lab.) Dec. 1984 16 p refs
(NASA-TM-86312; NAS 1.15:86312) Avail: NTIS HC A02/MF A01 CSCL 03B

Although heavy ion transport theory is developed to a relatively advanced stage, the present limitation in biomedical and electronic applications is the uncertainty in nuclear fragmentation parameters. The present status on Ne-20 beams is discussed and useful formulae are presented for future use in analysis of beam transport experiments. Author

N85-16729*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE GALACTIC GAMMA-RAY DISTRIBUTION: IMPLICATIONS FOR GALACTIC STRUCTURE AND THE RADIAL COSMIC RAY GRADIENT
A. K. Harding and F. W. Stecker Nov. 1984 28 p refs Submitted for publication
(NASA-TM-86173; NAS 1.15:86173) Avail: NTIS HC A03/MF A01 CSCL 03B

The radial distribution of gamma ray emissivity in the Galaxy was derived from flux longitude profiles, using both the final SAS-2 results and the recently corrected COS-B results and analyzing the northern and southern galactic regions separately. The recent CO surveys of the Southern Hemisphere, were used in conjunction with the Northern Hemisphere data, to derive the radial distribution of cosmic rays on both sides of the galactic plane. In addition to the 5 kpc ring, there is evidence from the radial asymmetry for spiral features which are consistent with those derived from the distribution of bright HII regions. Positive evidence was also found for a strong increase in the cosmic ray flux in the inner Galaxy, particularly in the 5 kpc region in both halves of the plane. Author

N85-16040# Joint Publications Research Service, Arlington, Va.
FLUCTUATIONS DURING OBSERVATIONS OF EXTRATERRESTRIAL SOURCES FROM OUTER SPACE THROUGH EARTH'S ATMOSPHERE Abstract Only
A. S. Gurvich *In its* USSR Rept.: Electron. and Elec. Eng. (JPRS-UEE-84-017) 17 Dec. 1984 p 14-15 Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. (Gorkiy, USSR), v. 27, no. 8, Aug. 1984 p 951-959 (For primary document see N85-16025 07-33)
Avail: NTIS HC A06

N85-16713# California Inst. of Tech., Pasadena.
THE COMPACT RADIO EMISSION REGIONS IN ACTIVE GALACTIC NUCLEI
A. C. S. Readhead *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 139-145 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16716# Max-Planck-Inst. fuer Radioastronomie, Bonn (West Germany).
VERY LONG BASE INTERFEROMETRY (VLBI) IN SPACE AND X-RAY OBSERVATIONS OF COMPACT SOURCES IN ACTIVE GALACTIC NUCLEI
Peter Biermann *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 157-159 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16719# Onsala Space Observatory (Sweden).
GALACTIC OH AND H2O MASERS
R. S. Booth *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 171-178 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

N85-16720# Academy of Sciences (USSR), Moscow. Inst. of Space Research.
WATER MASER OUTBURST
L. I. Matveyenko *In* ESA QUASAT: A VLBI Obs. in Space Sep. 1984 p 179-180 refs (For primary document see N85-16700 07-88)
Avail: NTIS HC A10/MF A01

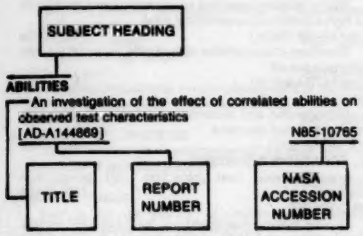
99 GENERAL

N85-16730*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
RESEARCH AND TECHNOLOGY, 1984 REPORT Annual Report
Nov. 1984 60 p refs
(NASA-TM-83096; NAS 1.15:83096) Avail: NTIS HC A04/MF A01 CSCL 05A

Research and technology projects in the following areas are described: cryogenic engineering, hypergolic engineering, hazardous warning instrumentation, structures and mechanics, sensors and controls, computer sciences, communications, material analysis, biomedicine, meteorology, engineering management, logistics, training and maintenance aids, and technology applications. B.G.

SUBJECT INDEX

Typical Subject Index Listing



The subject heading is the key to the subject content of the document. Titles, report numbers, and accession numbers of pertinent documents are provided under each subject heading. When the title is insufficiently descriptive of the document content, a title extension has been added, separated from the title by three hyphens. The report number helps to indicate the type of document cited (e.g., NASA report, NASA translation, NASA contractor report). The NASA accession number is the number by which the document abstracts are arranged in this journal and by which the document is sold or requested. The titles, with title extensions if present, are arranged under each subject heading in ascending accession number order. The subject headings have been selected from the latest revision of the *NASA Thesaurus* (NASA SP-7051).

A

A-10 AIRCRAFT
Performance evaluation of A-10 aircraft maintenance units and aircraft using constrained facet analysis
[AD-A146955] N85-15660
ABSORPTANCE
Changes in spectral properties of detached leaves
[E85-10042] N85-16243
Effect of integration time on precision of absorbances measured with a diode array UV-VIS spectrophotometer
[AD-A146952] N85-16624
ABSORPTION CROSS SECTIONS
Remote sensing of atmospheric gases with CO2 lasers. Continuation and conclusion of spectroscopic investigations
[BMFT-FB-W-84-030] N85-16285
ABSORPTION SPECTRA
Measurement of soft X-ray absorption spectra with a fluorescent ion chamber detector
[AD-A142213] N85-15838
ABSORPTIVITY
Optical properties of composite materials
[AD-A146768] N85-15828
Continuum absorption by H2O in the 700-1200 cm(-1) and 2400-260 cm(-1) windows
[AD-A147391] N85-16334
ABUNDANCE
The abundance of deuterium in the outer solar system from ground-based measurements of monodeuterated methane N85-16725
ACCELERATION (PHYSICS)
Diffusion in metals under high mechanical strain and acceleration
[JUEL-1913] N85-15887
Superconducting rotor dynamics
[AD-A147176] N85-16000
ACCELERATION TOLERANCE
Random pattern tracking acceleration tolerance tester
[AD-D011404] N85-16459
ACCELEROMETERS
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681
ACCUMULATORS
Power transfer from natural emitters to collection apertures at microwave wavelengths
[NASA-CR-174275] N85-15989
ACCURACY
Power of deterministic thinking in machine tool accuracy
[DE85-001751] N85-16188
ACETALDEHYDE
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850
ACETATES
Fatal hemorrhagic shock and acetate solutions
[AD-A146754] N85-16444
ACETONE
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
ACETYLENE
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
ACOUSTIC EMISSION
Identification of leaks: Internal acoustic method, phase 2
[PB85-101947/GAR] N85-15927
Quantitative acoustic emission techniques
[AERE-R-11262] N85-16203
In-situ stress determination in soil and rock using the acoustic emission method
[AD-A147459] N85-16215
ACOUSTIC IMPEDANCE
On the long range propagation of sound over irregular terrain
[NASA-CR-3862] N85-16589
ACOUSTIC MEASUREMENT
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT)
[NASA-TM-86919] N85-15757
Acoustic transducers for fast reactor instrumentation
[BLL-RISLEY-TR-4979-(9091.9F)] N85-16091
External cavity diode laser sensor
[AD-D011341] N85-16152
Quantitative acoustic emission techniques
[AERE-R-11262] N85-16203
ACOUSTICS
Basic research in electronic (JSEP): Joint Services Electronics Program
[AD-A147891] N85-16007
Statistical filtering as method for detecting transcrustal acoustic anomalies N85-16237
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590
ACOUSTO-OPTICS
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-018] N85-16014
Optimization piezoelectric transducer width of acousto-optical devices N85-16024
Study of optical sound generation and amplification
[AD-A147359] N85-16592
ACQUISITION
Acquisition planning at the Defense Communications Agency
[AD-A146877] N85-16669
ACRYLIC RESINS
Fluorinated diacrylic esters
[AD-D011328] N85-15889
Process for preparation of crosslinked poly(tri-n-butyltin) methacrylate with simultaneous particle size reduction
[AD-D011313] N85-15905
ACTIVATED CARBON
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15846
Versatility of peat emphasized N85-16316
ACTIVE CONTROL
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715
ACTUATION
Systems study for an Integrated Digital-Electric Aircraft (IDEA)
[NASA-CR-3840] N85-15714
ACTUATORS
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178
Mirror actuator control system
[AD-D011383] N85-16619
ADA (PROGRAMMING LANGUAGE)
Ada compiler validation summary report: New York University (NYU Ada/Ed) compiler, version 1.4 for VAX 11/780, using VMS 3.5
[AD-A146924] N85-16483
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a for Sun 120 Motorola M68010, using 4.2 BSD UNIX-Sun Version 1.1
[AD-A146925] N85-16484
NYU Ada/Ed user's guide: Version 1.4 for VAX/VMS systems
[AD-A146759] N85-16495
Ada training curriculum. Real-time systems in Ada I401 teacher's guide, volume 1
[AD-A146782] N85-16496
Ada training curriculum. Real-time systems in Ada I401 teacher's guide, volume 2
[AD-A146783] N85-16497
ADAPTATION
Use of shanks transformation for speeding up adaptation process in antenna arrays N85-16029
Vityaz specialists study human adaptability to ocean depths N85-16225
ADAPTIVE CONTROL
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
Logic elements for systems with variable structure N85-16054
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178
ADAPTIVE FILTERS
Studies in statistical signal processing
[AD-A147130] N85-15959
ADDITIVES
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099
ADHESION
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Cryogenic glass-to-metal seal
[AD-D011370] N85-15911
ADHESIVE BONDING
Evaluation of the alkaline peroxide pre-bond surface treatment for titanium
[AD-A147352] N85-15881
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909
ADHESIVES
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909
Corrosion properties of second-generation conductive materials N85-16348
ADSORPTION
The adsorption of CO and oxygen on Cu layers on a W(110) surface
[AD-A147345] N85-15847
ADVECTION
Razrezy program research in the tropical Atlantic N85-16229
An evaluation of an advection fog prediction model
[AD-A147436] N85-16403
AERATION
In-lake water quality management for Lake Eureka: Highlights of third year (1983) operation
[PB85-104149/GAR] N85-16289

AERIAL PHOTOGRAPHY
Evidence accumulation for spatial reasoning N85-16261
Forest area estimates from LANDSAT MSS and forest inventory plot data [PB85-105617/GAR] N85-16290
AEROACOUSTICS
Aeroacoustic data for high Reynolds number supersonic axisymmetric jets [NASA-TM-86296] N85-16587
AERODYNAMIC CHARACTERISTICS
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6 [NASA-TM-86345] N85-15657
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel [NASA-TM-86912] N85-15688
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations [NASA-CR-174299] N85-15690
Downwash in the plane of symmetry of an elliptically loaded wing [NASA-TP-2414] N85-15693
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing [NASA-TM-85674] N85-15695
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 8 to 1.5 [NASA-TP-2365] N85-15778
AERODYNAMIC COEFFICIENTS
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations [NASA-CR-174299] N85-15690
AERODYNAMIC CONFIGURATIONS
Systems study for an Integrated Digital-Electric Aircraft (IDEA) [NASA-CR-3840] N85-15714
AERODYNAMIC FORCES
An exploratory study of finite difference grids for transonic unsteady aerodynamics [NASA-TM-84583] N85-15696
AERODYNAMIC HEATING
Columbia: The first 5 flights entry heating data series. Volume 1: An overview [NASA-CR-171820] N85-15777
AERODYNAMIC LOADS
Operational loads measurement: A philosophy and its implementation N85-15665
Navy operational loads data sources and systems N85-15666
Operational loads data evaluation for individual aircraft fatigue monitoring N85-15669
Structural flight load measurement demonstration of structural integrity N85-15670
Aeroelastic analysis and the identification of flight loads — Mirage 2000 aircraft N85-15679
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681
Loads and Aeroelasticity Division research and technology accomplishments for FY 1984 and plans for FY 1985 [NASA-TM-86356] N85-15691
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces [NASA-TM-84589] N85-15697
Speed benefits of tilt-rotor designs for LHX [NASA-CR-166437] N85-15717
Flutter control with unsteady aerodynamic models [AD-A147858] N85-15753
AERODYNAMIC STABILITY
Flutter control with unsteady aerodynamic models [AD-A147858] N85-15753
AERODYNAMICS
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update [AD-A146966] N85-15661
Aero-optics experimental techniques [AD-A146755] N85-16067
AEROELASTICITY
Aeroelastic analysis and the identification of flight loads — Mirage 2000 aircraft N85-15679
Stereo Electro-optical Tracking System (SETS) [NASA-CR-172471] N85-16098
AEROSOLS
Comparison measurements on optical particle counters [BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
AEROSPACE ENGINEERING
Reduction method for thermal analysis of complex aerospace structures [NASA-TP-2373] N85-16066
SNAP (Space Nuclear Auxiliary Power) reactor overview [AD-A146831] N85-16612
Activities report of the aerospace industry in West Germany [ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany [ISSN-0722-3838] N85-16687
AEROSPACE ENVIRONMENTS
Testing changes in visual function due to orbital environment [AD-A147259] N85-16453
AEROSPACE INDUSTRY
BDLI memorandum on the future of space flight in the Federal Republic of Germany [NASA-TM-77624] N85-15765
AEROSPACE MEDICINE
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-015] N85-16416
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-027] N85-16426
AEROSPACE SYSTEMS
SNAP (Space Nuclear Auxiliary Power) reactor overview [AD-A146831] N85-16612
AEROSPACE TECHNOLOGY TRANSFER
Loads and Aeroelasticity Division research and technology accomplishments for FY 1984 and plans for FY 1985 [NASA-TM-86356] N85-15691
West Europe report: Science and technology [JPRS-WST-84-039] N85-15929
AEROTHERMODYNAMICS
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT) [NASA-TM-86919] N85-15757
Columbia: The first 5 flights entry heating data series. Volume 1: An overview [NASA-CR-171820] N85-15777
AFRICA
The mineralogy of global magnetic anomalies [E85-10061] N85-16272
Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current [AD-A147910] N85-16282
Synthesis of proterozoic data as a prerequisite for tectonic and thermal modeling [NASA-CR-174252] N85-16323
AFTERBODIES
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6 [NASA-TM-86345] N85-15657
AFTERGLOWS
Ionic reactions of atmospheric importance [AD-A147354] N85-16333
AGING (BIOLOGY)
Changes in spectral properties of detached leaves [E85-10042] N85-16243
AGING (METALLURGY)
Strength and aging behaviour of soft soldered joints [BLL-T6385/BG/WH800/84] N85-15862
AGRICULTURE
Detecting agricultural to urban land use change from multi-temporal MSS digital data — Salt Lake County, Utah [E85-10049] N85-16245
Exploring the use of structural models to improve remote sensing agricultural estimates N85-16259
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-015] N85-16416
AGROCLIMATOLOGY
An integrated remote sensing approach for identifying ecological range sites — parker mountain [E85-10050] N85-16246
The climate in food production in Latin America N85-16359
Crop yield forecasting N85-16360
The challenge of food production: The importance of climate N85-16361
Socio-economic impact of climate — Mexico N85-16372
Evaluation of the climatic resources of Cuba applied to agricultural work N85-16380
AGROMETEOROLOGY
Climate Conference for Latin America and the Caribbean [WMO-632] N85-16352
Crop yield forecasting N85-16360
The challenge of food production: The importance of climate N85-16361
The management of atmospheric resources in food production N85-16362
Water and climate, study of one case N85-16369
Evaluation of the climatic resources of Cuba applied to agricultural work N85-16380
The El Nino phenomenon and its agrometeorological implications N85-16382
AILERONS
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing [NASA-TM-85674] N85-15695
Shutdown characteristics of the Mod-O wind turbine with aileron controls [NASA-TM-86918] N85-16299
AIR
Pathogenesis and treatment of cerebral air embolism and associated disorders [AD-A146723] N85-16443
AIR BREATHING BOOSTERS
Integral boost, heat protection, port covers and transition N85-15813
AIR COOLING
Cooling system investigation of the 3-kW MEP models 016A, 021A, and 026A (60Hz, 400-Hz and 28-V dc) gasoline-engine-driven generator sets [AD-A147571] N85-16185
AIR FILTERS
Gas contamination detection device [AD-D011386] N85-15833
AIR FLOW
The 500 millibar sign frequency teleconnection charts: Winter [PB85-106276/GAR] N85-16410
AIR POLLUTION
Climate and water quality N85-16368
AIR SAMPLING
The CSIRO (Australia) atmospheric carbon dioxide monitoring program: Surface data [CSIRO-TP-6] N85-16324
AIR SEA ICE INTERACTIONS
Ice dynamics [AD-A147376] N85-16278
AIR TRAFFIC CONTROL
National airspace review: Airport radar service area operational confirmation report [DOT/FAA/AT-84/2] N85-15707
A bird strike handbook for base-level managers [AD-A147928] N85-16008
AIR WATER INTERACTIONS
Razrezy program research in the tropical Atlantic N85-16229
Frazil ice formation [AD-A147425] N85-16279
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
AIRBORNE EQUIPMENT
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
AIRBORNE/SPACEBORNE COMPUTERS
NOAA (National Oceanic and Atmospheric Administration) Aircraft Satellite Data Link (ASDL) [PB84-243773] N85-15976
Investigation of semiautomatic aircraft control processes employing time redundancy in on-board digital trajectory control computers N85-16048
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345
AIRCRAFT ACCIDENTS
Establishment of posture and working movements of pilot in air crash enquiries N85-16417
AIRCRAFT CONTROL
Aircraft thrust control scheme for terrain following system [AD-D011387] N85-15711
Investigation of semiautomatic aircraft control processes employing time redundancy in on-board digital trajectory control computers N85-16048
AIRCRAFT DESIGN
United States Air force aircraft modification process: A system dynamics analysis [AD-A146954] N85-15659
Design study of technology requirements for high performance single-propeller-driven business airplanes [NASA-CR-3863] N85-15692
AIRCRAFT ENGINES
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane [NASA-TM-85916] N85-15729
Monitoring engine thermal stresses N85-15735

Accelerated Mission Endurance Testing (AMET)
N85-15736
Design and test requirements for development of today's engines N85-15737
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines
[AD-A147092] N85-16073

AIRCRAFT EQUIPMENT
Voice command weapons launching system
[AD-D011378] N85-15940
cost and benefits optimization model for fault-tolerant aircraft electronic systems
[NASA-CR-166043] N85-15993
Military vital sign monitor
[AD-A147257] N85-16452
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16667

AIRCRAFT FUEL SYSTEMS
Aircraft wing fuel tank environmental simulator tests for evaluation of antimisting fuels
[FAA-CT-84-15] N85-15920

AIRCRAFT FUELS
Distribution and storage of aviation turbine fuel for military operations in northern Australia
[AD-A147180] N85-15921

AIRCRAFT HAZARDS
A bird strike handbook for base-level managers
[AD-A147928] N85-16008

AIRCRAFT LANDING
The effect of changes in the angle of incidence in the event of a richochet at a float step
[RAE-TRANS-2120] N85-15712
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
Aircraft barricade
[AD-D011316] N85-15761

AIRCRAFT MAINTENANCE
Performance evaluation of A-10 aircraft mainteance units and aircraft using constrained facet analysis
[AD-A146955] N85-15660
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
A Q-GERT network simulation model for examining pipeline time in the Navy's J-52 intermediate level jet engine repair cycle
[AD-A147269] N85-15663
Operational Loads Data
[AGARD-CP-375] N85-15664
F-16 force management, yesterday, today and tomorrow N85-15674
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16667

AIRCRAFT MANEUVERS
Evaluation of operational loads to verify structural design N85-15677

AIRCRAFT NOISE
NOISEMAP 4.4 computer program update, operator's manual, addendum 1
[AD-A147091] N85-16503
Helicopter noise survey performed at Las Vegas, Novada, 19-21 January, 1984
[AD-A147392] N85-16593
Noise measurement flight test: Data-analyses aerospatiale AS-355F TwinStar helicopter
[AD-A147497] N85-16595

AIRCRAFT PARTS
US Army helicopter operational flight loads N85-15675
Helicopter data acquisition in WHL N85-15676
All-composite Airbus empennage N85-15931
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16667
The Air Force can improve its forecasts of aircraft spare parts requirements
[AD-A147911] N85-16682
Estimating wartime support resource requirements. Statistical and related policy issues
[AD-A147923] N85-16685

AIRCRAFT PERFORMANCE
Speed benefits of tilt-rotor designs for LHX
[NASA-CR-166437] N85-15717

AIRCRAFT RELIABILITY
Nondestructive inspection: Improved capabilities of techniciana
[AD-A147388] N85-16196

AIRCRAFT SAFETY
A bird strike handbook for base-level managers
[AD-A147928] N85-16008

AIRCRAFT STRUCTURES
Operational Loads Data
[AGARD-CP-375] N85-15664
Operational loads data evaluation for individual aircraft fatigue monitoring N85-15669
Structural flight load measurement demonstration of structural integrity N85-15670
Advanced fatigue monitoring on service aircraft N85-15671
F-16 force management, yesterday, today and tomorrow N85-15674
US Army helicopter operational flight loads N85-15675
Evaluation of operational loads to verify structural design N85-15677
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
All-composite Airbus empennage N85-15931
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints — aircraft structures
[LBF-FB-172/84] N85-16219

AIRCRAFT SURVIVABILITY
F-16 force management, yesterday, today and tomorrow N85-15674

AIRFOIL PROFILES
Effects of aircraft and flight parameters on energy-efficient profile descents in time-based metered traffic
[NASA-CR-172338-ADD] N85-15706

AIRFOILS
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade
[NASA-TM-86914] N85-15689
Aircraft wing fuel tank environmental simulator tests for evaluation of antimisting fuels
[FAA-CT-84-15] N85-15920
Some important problems in unsteady boundary layers including separation. 1: Nature of singularity on oscillating airfoils
[AD-A147897] N85-16087
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture
[NASA-TM-86898] N85-16096
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590

AIRFRAMES
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812

AIRGLOW
Study of infrared atmospheric emission
[AD-A147517] N85-16336

AIRLINE OPERATIONS
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16687

AIRSPACE
National airspace review: Airport radar service area operational confirmation report
[DOT/FAA/AT-84/2] N85-15707

ALABAMA
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283

ALASKA
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388

ALGAE
Problems associated with the utilization of algae in bioregenerative life support systems
[NASA-CR-166615] N85-16469
Algal culture studies related to a Closed Ecological Life Support System (CELSS)
[NASA-CR-177322] N85-16470

ALGORITHMS
Tristatic tracking filter used by the multistatic measurement system
[AD-A146885] N85-15769
cost and benefits optimization model for fault-tolerant aircraft electronic systems
[NASA-CR-166043] N85-15993
Influence of Faraday effect in ionosphere on nonmutuality of meteor radio channel N85-16037
A second-order accurate paraboilzed Navier-Stokes algorithm for internal flows
[NASA-CR-174258] N85-16059
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS)
[NASA-TP-2425] N85-16351
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487
An algorithm for assembly of stiffness matrices into a compacted data structure
[AD-A146727] N85-16492
Monotone operators in mathematical programming
[AD-A147309] N85-16506
Continuity of the null space basis and constrained optimization
[AD-A147038] N85-16538
Techniques for vector quantization
[AD-A147052] N85-16539
A dual quadratic programming algorithm
[AD-A147237] N85-16547
Extracting embedded generalized networks from linear programming problems
[AD-A147565] N85-16558
Structural optimization and other large-scale processes
[AD-A147895] N85-16564
Efficient computation of optimal time for transaction processing in a database system
[AD-A147568] N85-16693

ALIGNMENT
Upgrading flexible infrared waveguides
[AD-A146763] N85-16160

ALKALIES
Laser spectroscopy of alkali atom-tetrahaloethylene reactions
[AD-A147431] N85-15848

ALLOYS
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825

ALTITUDE
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT)
[NASA-TM-86919] N85-15757

ALTITUDE SIMULATION
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel
[NASA-TM-86912] N85-15688
The NASA Altitude Wind Tunnel (AWT): Its role in advanced icing research and development
[NASA-TM-86920] N85-15758

ALUMINUM
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
Experimental compliance calibration of the NASA Lewis Research Center Mode 2 fatigue specimen
[NASA-TM-86908] N85-16205

ALUMINUM ALLOYS
Mechanical property data 7050-t736511 alloy
[AD-A147365] N85-15882
Design of ordered intermetallic alloys for high-temperature structural use
[DE85-000897] N85-15885
Influence of constant amplitude and variable amplitude loading on crack initiation and micro crack propagation in Al 2024-T3
[DFVLR-FB-84-29] N85-16220
Electronic structure and properties of magnetic defects in Co(1+x)Al(1-x) and Fe(1+x)Al(1-x) alloys
[NASA-TM-77498] N85-16648

ALUMINUM COATINGS
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851

ALUMINUM NITRIDES
Aluminum nitride insulator for 3-5 MIS (Metal-Insulator-Semiconductor) applications
[AD-A147842] N85-16662

ALUMINUM OXIDES
An optical and mass spectrometric study of the aluminum-oxygen flame
[AD-A147434] N85-15849
Microbiological method for the desiliconization of high-alica bauxites
[BLL-MINTEK-TR-1168-(5810.5759)] N85-15864
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15863
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
Transformation toughened ceramics for the heavy duty diesel engine technology program
[NASA-CR-174689] N85-16698

ALVEOLI
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439

AMAZON REGION (SOUTH AMERICA)
Water and climate, study of one case N85-16389

The water balance and climate — Amazon region N85-16370
Ecological impacts of hydroelectric projects in Amazonia N85-16374
The Amazon and climate N85-16376

AMBIENT TEMPERATURE
NBS (National Bureau of Standards) daylight availability database [PB84-245745] N85-16688

AMBIGUITY
Ambiguity and uncertainty in probabilistic inference [AD-A147378] N85-16572

AMMONIA
Silazane precursors to silicon nitride [AD-A146791] N85-15890

AMORPHOUS MATERIALS
Application of the diffraction model to amorphous magnesium zinc alloys [AD-A147389] N85-15883
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium [AD-A147688] N85-15915

AMORPHOUS SEMICONDUCTORS
Laser annealing of ion implanted semiconductors [AD-A146979] N85-16652

AMPHIBIA
The development of the vestibular apparatus under conditions of weightlessness [NASA-TM-77517] N85-16422

AMPLIFICATION
Array sidelobes, error tolerance, gain, and beamwidth [AD-A147004] N85-15956
New construction principles for oscillator power summing devices N85-16016

AMPLITUDES
Low noise multiple crystal-controlled oscillator [AD-D011401] N85-16010
An analytical model of periodic waves in shallow water [AD-A147501] N85-16085
An analytical model of periodic waves in shallow water [AD-A147502] N85-16086

ANALOG CIRCUITS
Ensuring required metrological reliability of analog instrument channels by parametric compensation N85-16050
A general theory of circuit analogy in fracture diagnosis [AD-A147177] N85-16212

ANALOG TO DIGITAL CONVERTERS
Analog to digital converter [AD-D011338] N85-15983
Power spectrum analysis of astronomical photographs digitised with small apertures N85-16127

ANALOGIES
A general theory of circuit analogy in fracture diagnosis [AD-A147177] N85-16212

ANALOGS
A total dose characterization of five commercial analog multiplexers [AD-A146886] N85-15997

ANALYSIS (MATHEMATICS)
Nonlinear semigroups and evolution governed by accretive operators [AD-A147556] N85-16557

ANALYTICAL CHEMISTRY
Ion microscopy of metals and semiconductors [AD-A147118] N85-16826

ANALYZERS
Bragg cell spectrum analyzer specification [AD-D011320] N85-16629

ANGLE OF ATTACK
Experiences with the use of a side-strut model support system for high angles of attack in the Trinsonik wind tunnel TMK [DFVLR-MITT-84-09] N85-15763
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 5 to 1.5 [NASA-TP-2365] N85-15778

ANGLES (GEOMETRY)
The effect of changes in the angle of incidence in the event of a richochet at a float step [RAE-TRANS-2120] N85-15712
Tolerance synthesis of multilayer radome walls N85-16041

ANGULAR RESOLUTION
Limitation of VLBI angular resolution N85-16710
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies — QUASAT N85-16723

ANIONS
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory [AD-A147161] N85-15844

ANISOTROPIC MEDIA
Reflection theorems for some anisotropic media N85-16038

ANNEALING
Defective nature of the crystalline lattice of nickel ferrite-based solid solutions [BLL-WH-595-(9091.9F)] N85-16645
X-ray and backscattering analysis of ion implantation phenomena in GaAs and related compounds [AD-A147449] N85-16659

ANNUAL VARIATIONS
Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current [AD-A147910] N85-16262
The problem of climate and climate variation N85-16353
Evaluation of the climatic resources of Cuba applied to agricultural work N85-16380
The use of hydrometeorological data in explaining shrimp cycles in Guyana N85-16381
Interrelationship of atmospheric parameters in Honduras [AD-A147371] N85-16401

ANNULAR FLOW
An improved computer model for prediction of axial gas turbine performance losses [NASA-CR-174246] N85-15724

ANODES
The anode mechanism of a thermal argon arc [NASA-TM-77754] N85-15835
The development and test of ultra-large-format multi-anode microchannel array detector systems [NASA-CR-174247] N85-16622

ANODIC COATINGS
Method for bonding insulator to insulator [AD-D011340] N85-15891

ANOMALIES
Statistical filtering as method for detecting transcrustal acoustic anomalies N85-16237
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
Climate and fisheries: A Peruvian case study N85-16373
The 500 millibar sign frequency teleconnection charts: Winter [PB85-106276/GAR] N85-16410

ANTARCTIC REGIONS
Earth science investigations in the United States Antarctic Research Program (USARP) [PB84-240506] N85-16288

ANTENNA ARRAYS
Characterization of MMIC devices for active array antennas [NASA-TM-86907] N85-15779
Array sidelobes, error tolerance, gain, and beamwidth [AD-A147004] N85-15956
Parallel processor configuration for adaptive antenna arrays [AD-D011347] N85-15970
Basic research in electronic (JSEP): Joint Services Electronics Program [AD-A147891] N85-16007
Use of shanks transformation for speeding up adaptation process in antenna arrays N85-16029
Analysis of effectiveness of partial optimization of spatial processing systems N85-16031
Determination of row-and-column control principle of phase antenna array from amplitude-phase distribution of field in aperture N85-16033
Infrared technology for satellite power conversion --- antenna arrays and bolometers [NASA-CR-174266] N85-16293

ANTENNA COMPONENTS
Characterization of MMIC devices for active array antennas [NASA-TM-86907] N85-15779

ANTENNA COUPLERS
Hardwire missile receiver coupler [AD-D011350] N85-15936

ANTENNA DESIGN
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna [NASA-CR-174268] N85-15944
A low-sidelobe space feed lens [AD-A147883] N85-15972
Dual band, low sidelobe, high efficiency mirror antenna [AD-D011329] N85-15980
Compact wideband multiple conductor monopole antenna [AD-D011331] N85-15981

ANTENNA FEEDS
Hardwire missile receiver coupler [AD-D011350] N85-15936
Dual offset reflector antenna systems with rotationally symmetric aperture distributions [AD-A147346] N85-15961
A low-sidelobe space feed lens [AD-A147883] N85-15972

ANTENNA RADIATION PATTERNS
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna [NASA-CR-174268] N85-15944
Dual offset reflector antenna systems with rotationally symmetric aperture distributions [AD-A147346] N85-15961
Efficient computation of reflector antenna aperture distributions and far field patterns [AD-A147367] N85-15962

ANTENNAS
MMIC devices for active phased array antennas [NASA-CR-174281] N85-15943
Data appendix: F-number = 1.0 EMR with a flexible back electrode [NASA-CR-172477] N85-15994
USSR report: Electronics and electrical engineering [JPRS-UEE-84-017] N85-16025
Reduction method for thermal analysis of complex aerospace structures [NASA-TP-2373] N85-16066

ANTIBODIES
Induction of immunity to toxins with anti-idiotypic antibody [AD-A146793] N85-16445

ANTIFOULING
Process for preparation of crosslinked poly(tri-n-butyltin) methacrylate with simultaneous particle size reduction [AD-D011313] N85-15905

ANTIMISTING FUELS
Aircraft wing fuel tank environmental simulator tests for evaluation of antimisting fuels [FAA-CT-84-15] N85-15920

ANTIRADIATION DRUGS
Chemical protection against ionizing radiation [AD-A147822] N85-16457

APERTURES
Characterization of MMIC devices for active array antennas [NASA-TM-86907] N85-15779
Dual offset reflector antenna systems with rotationally symmetric aperture distributions [AD-A147346] N85-15961
Efficient computation of reflector antenna aperture distributions and far field patterns [AD-A147367] N85-15962
Power transfer from natural emitters to collection apertures at microwave wavelengths [NASA-CR-174275] N85-15989

APOLLO APPLICATIONS PROGRAM
The evolution of civilian in-space infrastructure, i.e., space station concepts in the United States N85-15788

APOLLO PROJECT
The evolution of civilian in-space infrastructure, i.e., space station concepts in the United States N85-15788

APPROXIMATION
Determination of moments of initial estimate during linear approximation of distribution of ejected impurity N85-16045
Numerical methods and approximation and modelling problems in stochastic control theory [AD-A146927] N85-16533
A counterexample to a result of Strang and Fix concerning controlled approximation [AD-A147360] N85-16550
Spline methods for approximating quantile functions and generating random samples [NASA-TP-2389] N85-16565

AQUATIC PLANTS
Effects of low temperatures on the growth and unfrozen water content of an aquatic plant [AD-A147107] N85-16424

ARC DISCHARGES
The discharge mechanism of the high-temperature arc [NASA-TM-77794] N85-15837
Gas pressure and electron density in the active zone level of hollow cathode arc discharges [NASA-TM-77468] N85-15968

ARC JET ENGINES
Axisymmetric electromagnetic field influence on the characteristic velocity of an arc-jet [NASA-TM-77475] N85-15942

ARCHITECTURE (COMPUTERS)
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix [AD-A146848] N85-15953

Upset susceptibility study employing circuit analysis and digital simulation — digital systems and electromagnetic interference N85-16344
Future database machine architectures [AD-A146786] N85-16481
Computer science research in Europe [AD-A146905] N85-16482
Local area network evaluation by MICROSS extensions [AD-A146773] N85-16521

ARCTIC OCEAN
Satellite photographs suggest arctic volcano N85-16239
Arctic marine acoustics [AD-A147492] N85-16594

ARCTIC REGIONS
Satellite photographs suggest arctic volcano N85-16239
Parachute expedition to Arctic N85-16240

ARGON
The discharge mechanism of the high-temperature arc [NASA-TM-77794] N85-15837

ARRAYS
Transmission line biased coherent array of Josephson oscillators [AD-D011323] N85-15979
RF laser array driver apparatus [AD-D011375] N85-16155
Phased locked array laser systems [AD-D011317] N85-16164
The development and test of ultra-large-format multi-anode microchannel array detector systems [NASA-CR-174247] N85-16622
Switchable zero order diffraction gratings as light valves [AD-A147575] N85-16633

ARRESTING GEAR
Aircraft barricade [AD-D011316] N85-15761

ARTERIES
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439

ARTIFICIAL INTELLIGENCE
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa) [AD-A147890] N85-16458
Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] N85-16474
Implementation of a constraint machine for prism - A parallel problem solver [AD-A147844] N85-16512

ARTIFICIAL SATELLITES
Upper Atmosphere Research Satellite (UARS) trade analysis [NASA-CR-175269] N85-15774

ARTILLERY
The electronic typesetting program programmer's manual [AD-A147500] N85-16508

ASTHMA
Short-term human respiratory effects of nitrogen dioxide: Determination of quantitative dose-response profiles. Phase 2: Exposure of asthmatic volunteers to 4 PPM NO2 [PB85-104386/GAR] N85-16462

ASTROMETRY
Plate measurements and reductions at Muenster — astronomical photography N85-16129
First tests on the astrometric performance of the new PDS1010G at Hamburg Observatory — granite microdensitometer N85-16135
Astrometric applications of the Mt. Stromlo PDS 1010A — microdensitometer N85-16136
Automated star counts in nebulous areas N85-16137

ASTRONAVIGATION
Optimization of orientation in navigation by two heavenly bodies N85-16027
Errors of analog of inertial coordinate systems modeled in astronavigation system N85-16028

ASTRONOMICAL COORDINATES
Optimization of orientation in navigation by two heavenly bodies N85-16027

ASTRONOMICAL MAPS
Automated star counts in nebulous areas N85-16137

ASTRONOMICAL OBSERVATORIES
Pointing and control system design study for the space Infrared telescope facility (SIRTF) [NASA-CR-166612] N85-15795
Recalibration of the KPNO spot sensitometers — Kitt Peak National Observatory N85-16103
Some nonatlas work at the European Southern Observatory (ESO) Sky Atlas Laboratory — astronomical photography N85-16117
The work of the photolabs at the Royal Observatory, Edinburgh — astronomical photography N85-16122
SIRTF: The next step [NASA-TM-86663] N85-16724

ASTRONOMICAL PHOTOGRAPHY
Astronomical photography 1984 — conferences [ROE-OR-14] N85-16102
SENSIT.FOR: A program for sensitometric reduction N85-16105
A spectrosensitometer with an absolute calibration N85-16106
Comparison of the fine grain compensation hypersensitization (FAH) process with gas hypersensitizing techniques — astronomical photography plates N85-16107
The results of hydrogen hypersensitization of photoemulsions — astronomical photography N85-16108
Nitrogen flushing during exposure of large Schmidt telescope plates N85-16109
The most effective astronomical photographic emulsions for recording of faint and low-contrast objects N85-16110
Astronomical applications of new infrared films N85-16111
The 3a-F emulsion and the quasar redshift cut-off N85-16112
Microspots on spectroscopic plates — astronomical photography N85-16113
Where to next in astronomical photography? — tabular grain emulsions N85-16114
What do we want: Increased speed, resolution, contrast or DQE? — astronomical photography N85-16115
Some aspects of photography with a small Schmidt camera — astronomical photography N85-16116
Some nonatlas work at the European Southern Observatory (ESO) Sky Atlas Laboratory — astronomical photography N85-16117
Using a Gossen light meter to produce enlarged interpositive film copies from glass plates — astronomical photography N85-16118
Unsharp masking at the enlarger — astronomical photography N85-16119
Processing of photographic observing material at the National Astronomical Observatory Rozhen N85-16120
The UK Schmidt telescope and the facilities in Edinburgh N85-16121
The work of the photolabs at the Royal Observatory, Edinburgh — astronomical photography N85-16122
An investigation into the fidelity of reproduction of UKST original objective prism plates on to film — United Kingdom Schmidt Telescope (UKST) N85-16123
Power spectrum analysis of astronomical photographs digitised with small apertures N85-16127
Recent developments on the COSMOS plate-scanning machine — microdensitometer N85-16128
Plate measurements and reductions at Muenster — astronomical photography N85-16129
The Torun measuring system for astronomical spectra N85-16130
The Malin effect in stellar photography N85-16131
Some applications of signal-to-noise in photographic stellar photometry N85-16132
Stellar photographic photometry using a double wedge technique with a focal reducer system N85-16133

ASTROPHYSICS
Testing theories of superluminal motion — QUASAT N85-16714

ASYMPTOTIC METHODS
An operator method for computing the asymptotics of a collision resolution interval [AD-A146837] N85-16528
Local likelihood estimation [AD-A147317] N85-16571

ASYMPTOTIC SERIES
An asymptotic analysis of a transient p-n junction model [AD-A147270] N85-16004

ATLANTIC OCEAN
Razrezy program research in the tropical Atlantic N85-16229
Conditions governing the formation of stratocumulus clouds over the western Atlantic during cold air outbreaks [AD-A146780] N85-16383
A compilation of moored current meter and wind recorder data. Volume 35: Long-Term Upper Ocean Study (LOTUS) (Moorings 764, 765, 766, 767, 770), May 1982 - April 1983 [AD-A147103] N85-16412
The long term upper ocean study (LOTUS). Cruise summary and hydrographic data report, OCEANUS 154, May 1984 [AD-A147908] N85-16414
Oceanographic data for development of the US exclusive economic zone [PB85-106458/GAR] N85-16415

ATMOSPHERIC ATTENUATION
Multiple scattering effects on transmission through the atmosphere [AD-A147527] N85-15969

ATMOSPHERIC CHEMISTRY
Application of quantum chemistry of atmospheric chemistry [AD-A147035] N85-15843
Remote sensing of atmospheric gases with CO2 lasers. Continuation and conclusion of spectroscopic investigations [BMFT-FB-W-84-030] N85-16265
Ionic reactions of atmospheric importance [AD-A147354] N85-16333

ATMOSPHERIC CIRCULATION
The 500 millibar sign frequency teleconnection charts: Winter [PB85-106276/GAR] N85-16410

ATMOSPHERIC COMPOSITION
The CSIRO (Australia) atmospheric carbon dioxide monitoring program: Surface data [CSIRO-TP-8] N85-16324

ATMOSPHERIC DENSITY
Continuum absorption by H2O in the 700-1200 cm(-1) and 2400-280 cm(-1) windows [AD-A147391] N85-16334

ATMOSPHERIC ELECTRICITY
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer [AD-A147436] N85-15965

ATMOSPHERIC MODELS
Fluctuations during observations of extraterrestrial sources from outer space through Earth's atmosphere N85-16040
Research in geodesy based upon radio interferometric observations of extragalactic radio sources [AD-A147581] N85-16280
Atmospheric Modeling And Sensor Simulation (AMASS) study [NASA-CR-171283] N85-16325
The role of finite parallel length on the stability of barium clouds [AD-A146972] N85-16329
The effects of long-periodic forcing in a zero-dimensional climate model N85-16363
Index cycles simulated by a low order forced barotropic model N85-16364
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters [AD-A147574] N85-16404

ATMOSPHERIC MOISTURE
Atmospheric environment for Space Shuttle (STS-41G) launch [NASA-TM-86486] N85-16320

ATMOSPHERIC PHYSICS
USSR report: Earth sciences [JPRS-UES-84-006] N85-16223
Continuum absorption by H2O in the 700-1200 cm(-1) and 2400-280 cm(-1) windows [AD-A147391] N85-16334
Study of infrared atmospheric emission [AD-A147517] N85-16336

ATMOSPHERIC PRESSURE
Atmospheric environment for Space Shuttle (STS-41G) launch [NASA-TM-86486] N85-16320
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F [AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F [AD-A146918] N85-16389
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F [AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Louisiana, parts A-F [AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida [AD-A147203] N85-16396
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea [AD-A147204] N85-16397

Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16396
Revised Uniform Summary of Surface Weather Observations (RUSSWO). O'Hare International Airport, Chicago, parts A-F
[AD-A147206] N85-16399
ATMOSPHERIC REFRACTION
Fluctuations during observations of extraterrestrial sources from outer space through Earth's atmosphere N85-16040
C2 sub n (optical) studies in the free atmosphere based on rawinsonde data
[AD-A147307] N85-16332
ATMOSPHERIC SCATTERING
Multiple scattering effects on transmission through the atmosphere
[AD-A147527] N85-15869
ATMOSPHERIC TEMPERATURE
Atmospheric environment for Space Shuttle (STS-41G) launch
[NASA-TM-86486] N85-16320
The effects of long-periodic forcing in a zero-dimensional climate model N85-16363
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F
[AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F
[AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F
[AD-A146915] N85-16386
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F
[AD-A146918] N85-16389
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Louisiana, parts A-F
[AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea
[AD-A147204] N85-16397
Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16398
Revised Uniform Summary of Surface Weather Observations (RUSSWO). O'Hare International Airport, Chicago, parts A-F
[AD-A147206] N85-16399
ATOMIC COLLISIONS
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields
[AD-A146854] N85-16602
ATOMIC STRUCTURE
Electron spectrometry experiments with the use of synchrotron radiation
[DE85-001286] N85-16610
Electronic structure and properties of magnetic defects in Co(1+x)Al(1-x) and Fe(1+x)Al(1-x) alloys
[NASA-TM-77496] N85-16648
ATROPINE
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics
[AD-A146851] N85-16423
ATTACKING (ASSAULTING)
NyKINM, a further development of KINM 22 — simulation of a robot attack on an aircraft
[FOA-C-20558-D6(E3)] N85-15720
AUDIO FREQUENCIES
Current and current shear effects in the parabolic approximation for underwater sound channels
[AD-A147833] N85-16597
AUDIO SIGNALS
Specifics of dynamics of brain biopotentials under the influence of complex audible communicative signals N85-16440
AUDITORY PERCEPTION
Specifics of dynamics of brain biopotentials under the influence of complex audible communicative signals N85-16440
Detection of low frequency impulsive noise from large wind turbine generators
[NASA-CR-172511] N85-16568
AUSTENITIC STAINLESS STEELS
Austenitic stainless steel for high temperature and pressure applications
[BLL-RISLEY-TR-4527-(9091.9F)] N85-15860
AUTOMATIC CONTROL
Fiat, Peugeot introduce integrated robotized engine: CAD used N85-15933
Control technology for integrated circuit fabrication at Micro-Circuit Engineering, Incorporated, West Palm Beach, Florida
[PB85-100717/GAR] N85-16013
Investigation of semiautomatic aircraft control processes employing time redundancy in on-board digital trajectory control computers N85-16048
Automatic camera tracking for remote manipulators
[DE85-001897] N85-16187
Interaction of human cognitive models and computer based models in supervisory control
[AD-A142547] N85-16474
Human factors characteristics of the Joint Tactical Fusion Test Bed: Field test 467 results
[AD-A146856] N85-16476
Microcomputer control of a residential photovoltaic power conditioning system
[DE84-014774] N85-16488
AUTOMATIC PILOTS
Polaris guidance system
[AD-D011324] N85-15704
AUTOMATIC TEST EQUIPMENT
Diagnostic apparatus for radar pulse repetition frequency control circuit card
[AD-D011364] N85-15938
AUTOMATION
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929
AUTOMOBILE ENGINES
Fiat, Peugeot introduce integrated robotized engine: CAD used N85-15933
AUTOMOBILE FUELS
Some characteristics of automotive gasolines and their performance in a light aircraft engine
[FAA-CT-84-12] N85-15919
AUTOMOBILES
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929
AUTOREGRESSIVE PROCESSES
Texture classification using autoregressive filtering N85-16254
Autoregressive spectral estimation for two dimensional time series N85-16258
Conditionally heteroscedastic autoregressions
[AD-A147168] N85-16567
Infinite order autoregressive representations of multivariate stationary stochastic processes
[AD-A147863] N85-16580
AUXILIARY POWER SOURCES
SNAP (Space Nuclear Auxiliary Power) reactor overview
[AD-A146831] N85-16612
AVALANCHES
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046
Automated Lavina collects data on snow N85-16224
AVIONICS
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949
AXIAL FLOW
Development of a Navier-Stokes rotor and stator analysis
[AD-A146967] N85-16070
AXIAL LOADS
Life prediction at high temperature under multiaxial loading N85-15745
AXISYMMETRIC FLOW
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel
[NASA-TM-86912] N85-15688
A computer program for the performance analysis of scarfed nozzles
[AD-A147370] N85-15730
Aeroacoustic data for high Reynolds number supersonic axisymmetric jets
[NASA-TM-86296] N85-16587

B

BACKGROUND NOISE
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer
[AD-A147438] N85-15965
Microseism level, time variations at Turkmen seismic stations studied N85-16231
BACKGROUND RADIATION
Cosmology N85-16701
BACKSCATTERING
Intermediate results of radar backscatter measurements from summer sea ice
[AD-A147212] N85-15960
Method for non contacting gauging of the wall thickness of tubes by backscattering radiation
[OEFZS-4274] N85-16144
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar
[NASA-TM-86167] N85-16273
BACTERIA
Microbiological method for the desiliconization of high-silica bauxites
[BLL-MINTEK-TR-1168-(5810.5759)] N85-15864
BALLISTIC TRAJECTORIES
Tristatic tracking filter used by the multistatic measurement system
[AD-A146885] N85-15769
BALLISTICS
ILIR task of digital recoil travel measurement system
[AD-A147102] N85-16140
BALLOONS
Results of the 1984 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-174270] N85-16294
BANACH SPACE
Stable monotone variational inequalities
[AD-A147123] N85-16544
BANDPASS FILTERS
Charge domain filters for enhanced monolithic signal processing
[AD-A147428] N85-15964
BANDWIDTH
Pulse code modulation telemetry: Properties of various binary modulation types
[AD-A147214] N85-15780
Array sidelobes, error tolerance, gain, and beamwidth
[AD-A147004] N85-15956
BARIUM
The role of finite parallel length on the stability of barium clouds
[AD-A146972] N85-16328
BAROTROPIC FLOW
Index cycles simulated by a low order forced barotropic model N85-16364
BARRIER LAYERS
Diffusion barrier for long wavelength laser diodes
[AD-D011390] N85-16157
BARS
Thermal-mechanical fatigue crack growth in Inconel X-750
[NASA-CR-174740] N85-15877
BATTERY CHARGERS
Performance characteristics of a battery charger and state-of-charge indicator
[NASA-CR-174273] N85-15992
Battery control and fault detection method
[AD-D011384] N85-16307
BAUXITE
Microbiological method for the desiliconization of high-silica bauxites
[BLL-MINTEK-TR-1168-(5810.5759)] N85-15864
BAYES THEOREM
Bayesian estimation of normal mixture parameters N85-16255
Spatial estimation from remotely sensed data via empirical Bayes models N85-16256
Multivariate spline methods in surface fitting N85-16257
Bayesian estimation of undetected errors
[AD-A147198] N85-16545
Belief structures
[AD-A147526] N85-16575
BEAM SPLITTERS
Precision electrooptical deflector based on corrugated light guide N85-16020
BEAMS (RADIATION)
Tracking servo compensator with rate aiding
[AD-D011372] N85-15971
Design and testing of a refractive laser beam homogenizer
[AD-A146997] N85-16162

Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16638
BEARINGS
Improvement of the corrosion resistance of turbine engine bearings
[AD-A147430] N85-15731
Thermally isolated structural support link
[AD-D011349] N85-16176
Bearing tester fit analysis
[NASA-CR-171282] N85-16181
BEDS (PROCESS ENGINEERING)
Influence of size grading of sintering ore on the sintering process
[BLL-M-36004-(5828.4)] N85-15854
BEHAVIOR
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-027] N85-16426
Model of team organization and behavior and team description method
[AD-A147540] N85-16680
BENZENE
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
BESSEL FUNCTIONS
Some scientific subroutines in LISP
[AD-A147869] N85-16515
BETA FACTOR
Experimental results on Tokamak beta limits from ISX-B
[DE84-015372] N85-16644
BIBLIOGRAPHIES
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update
[AD-A146966] N85-15661
Loads and Aeroelasticity Division research and technology accomplishments for FY 1984 and plans for FY 1985
[NASA-TM-86356] N85-15691
Optics of solids (surface related) and effect of surface roughness on MOS
[AD-A146883] N85-15996
Earth science investigations in the United States Antarctic Research Program (USARP)
[PB84-240506] N85-16286
BIG BANG COSMOLOGY
Cosmology N85-16701
BINARY ALLOYS
Application of the diffraction model to amorphous magnesium zinc alloys
[AD-A147369] N85-15883
BINARY SYSTEMS (MATERIALS)
Photochemistry and kinetics of the O*2-HI system
[AD-A147433] N85-16167
BIOCHEMISTRY
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
Biochemical evaluation of bodily influence of high and low temperatures N85-16441
BIODYNAMICS
Biodynamic resistant control stick
[AD-D011380] N85-15721
BIOELECTRIC POTENTIAL
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
Specifics of dynamics of brain biopotentials under the influence of complex audible communicative signals N85-16440
BIOINSTRUMENTATION
A biological sensor for the detection of toxicants
[AD-D011304] N85-16141
BIOLOGICAL EFFECTS
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-027] N85-16426
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
BIOLOGICAL MODELS (MATHEMATICS)
Control and modeling of a CELSS (Controlled Ecological Life Support System)
[NASA-CR-177324] N85-16472
BIOLUMINESCENCE
Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner
[AD-A147909] N85-16281
BIOMASS ENERGY PRODUCTION
Versatility of peat emphasized N85-16316
BIOMETEOROLOGY
Ecological impacts of hydroelectric projects in Amazonia N85-16374
BIONICS
Eyes for computers N85-16428
BIOPHYSICS
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
BIOTITE
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272
BIRD-AIRCRAFT COLLISIONS
A bird strike handbook for base-level managers
[AD-A147928] N85-16008
BISMUTH
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15880
BITUMENS
Immobilization of toxic waste by embedding it in bitumen
[OEFZS-4277] N85-16322
BLACK AND WHITE PHOTOGRAPHY
Some nonatlas work at the European Southern Observatory (ESO) Sky Atlas Laboratory — astronomical photography N85-16117
BLACK HOLES (ASTRONOMY)
Some aspects of active galactic nuclei N85-16702
BLACK SEA
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
BLASIUS EQUATION
Existence and non-uniqueness of similarity solutions of a boundary layer problem
[NASA-CR-172503] N85-16064
BLOCKING
A simulator for determining the performance of transaction manager and lock manager combinations in a database
[AD-A147827] N85-16696
BLOOD
Fatal hemorrhagic shock and acetate solutions
[AD-A146754] N85-16444
BLOOD CIRCULATION
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439
Biochemical evaluation of bodily influence of high and low temperatures N85-16441
Carotid baroreceptor influences on peripheral circulatory and thermal responses during cold exposure
[AD-A146808] N85-16447
Random pattern tracking acceleration tolerance tester
[AD-D011404] N85-16459
BLOOD FLOW
Distribution of blood flow to brain, kidneys, gut, spleen and posterior extremities in cats in acute hypoxia N85-16434
BLOOD PRESSURE
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
Carotid baroreceptor influences on peripheral circulatory and thermal responses during cold exposure
[AD-A146808] N85-16447
BLOWDOWN WIND TUNNELS
Experiences with the use of a side-strut model support system for high angles of attack in the Trisonik wind tunnel TMK
[DFVLR-MITT-84-09] N85-15763
BLUE GREEN ALGAE
Production of hydrogen by cyanobacteria
[PB85-113421/GAR] N85-15825
BODIES OF REVOLUTION
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6
[NASA-TM-86345] N85-15657
BODY TEMPERATURE
Biochemical evaluation of bodily influence of high and low temperatures N85-16441
Comparison of thermal responses between rest and leg exercise in water
[AD-A146818] N85-16448
BODY WEIGHT
Effects of body mass and morphology on thermal responses in water
[AD-A147568] N85-16455
BOILING
Method for making alloy additions to base metals having higher melting points
[AD-D011403] N85-15884
BOLOMETERS
Fast granular superconducting bolometer
[AD-D011332] N85-16093
Infrared technology for satellite power conversion — antenna arrays and bolometers
[NASA-CR-174266] N85-16293
BONDING
Method for bonding insulator to insulator
[AD-D011340] N85-15691
BOOMS (EQUIPMENT)
F-8 refueling boom ground vibration test
[NASA-TM-84914] N85-15713
BOUNDARY LAYER CONTROL
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update
[AD-A146966] N85-15661
BOUNDARY LAYER FLOW
The resistance and mobility functions of two equal spheres in low Reynolds number flow
[AD-A147301] N85-16080
BOUNDARY LAYER SEPARATION
Unsteady flow characteristics in the near-wake of a two-dimensional obstacle
[NASA-TM-77762] N85-15684
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies
[AD-A146964] N85-16069
Some important problems in unsteady boundary layers including separation. 1: Nature of singularity on oscillating airfoils
[AD-A147897] N85-16067
BOUNDARY LAYER STABILITY
On the instability of a 3-dimensional attachment line boundary layer: Weakly nonlinear theory and a numerical approach
[NASA-CR-172504] N85-16063
BOUNDARY LAYERS
Existence and non-uniqueness of similarity solutions of a boundary layer problem
[NASA-CR-172503] N85-16064
Aero-optics experimental techniques
[AD-A146755] N85-16067
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies
[AD-A146964] N85-16069
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
BOUNDARY VALUE PROBLEMS
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
Multivariate spline methods in surface fitting N85-16257
Solution of partial differential equations on vector and parallel computers
[NASA-CR-172500] N85-16525
An operator method for computing the asymptotics of a collision resolution interval
[AD-A148837] N85-16528
Viscosity solutions of Hamilton-Jacobi equations at the boundary
[AD-A147444] N85-16553
BRAGG ANGLE
Bragg cell spectrum analyzer specification
[AD-D011320] N85-16629
BRAIN
Distribution of blood flow to brain, kidneys, gut, spleen and posterior extremities in cats in acute hypoxia N85-16434
Lateral specifics of visual perception N85-16436
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa)
[AD-A147890] N85-16458
BRAIN CIRCULATION
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
BRAIN STEM
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
BRAKES (FOR ARRESTING MOTION)
Comparison between cycle ergometers with different mechanical braking systems
[FOA-C-54058-H1] N85-16193
BRANCHING (MATHEMATICS)
On the instability of a 3-dimensional attachment line boundary layer: Weakly nonlinear theory and a numerical approach
[NASA-CR-172504] N85-16063

BRAZIL
Integrated analysis of remote sensing products from basic geological surveys — Brazil
[E85-10052] N85-16248
BRAZING
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
Repair welding and brazing procedures for turbine components and investigation of the brazing behavior of thin filler foils
[MTU-TB-908/84] N85-16190
BRIDGES (STRUCTURES)
The Shock and Vibration Digest, volume 16, no. 9
[AD-A146779] N85-16200
BRIDGMAN METHOD
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15880
BRILLOUIN ZONES
A study of structural phase transitions using light scattering techniques
[AD-A147261] N85-16654
BROADBAND
Distributed reservation-based code division multiple access
[AD-A147007] N85-15957
Compact wideband multiple conductor monopole antenna
[AD-D011331] N85-15981
Lightweight, broadband Rayleigh wave transducer
[AD-D011345] N85-16584
BROADBAND AMPLIFIERS
Development of a 30 GHz/1 kW broadband traveling wave tube with suppression of band edge oscillations
[BMFT-FB-W-84-035] N85-16011
New construction principles for oscillator power summing devices N85-16016
BROMINE COMPOUNDS
Study of the liquid vapor equilibrium in the bromine-hydrobromic acid-water system
[NASA-TM-77787] N85-15836
BUCKLING
A review of imperfection sensitivity of stiffened shells
[AD-A147311] N85-16213
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
BUDGETING
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A148806] N85-16667
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16687
BUMPY TORUSES
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643
BUOYANCY
Finite difference calculations of buoyant convection in an enclosure. Part 2: Verification of the nonlinear algorithm
[PB85-104065/GAR] N85-16089
BURNING RATE
Combustion properties of fuel-rich magnesium propellants with HTPB as binder
[FOA-C-20555-D1] N85-15924
BUS CONDUCTORS
EMI (electromagnetic interference) filter capacitor unit
[AD-D011392] N85-15941
BUTADIENE
Reactions of butadiyne. 1: The reaction with hydrogen atoms
[NASA-TM-77805] N85-15834
BUTANES
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
BY-PRODUCTS
Versatility of peat emphasized N85-16316
Oil-shale exploration expansion urged N85-16317
BYPASS RATIO
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86896] N85-15725

C

CABLES
Evaluation of the Kerie Cable thermal arc cutting equipment
[AD-A147813] N85-16186
CAISSONS
Safe decompression schedules for caisson workers
[PB85-103612/GAR] N85-16463
CALCIUM CHLORIDES
Salt action on concrete
[AD-A147812] N85-15912
CALCULUS OF VARIATIONS
Stable monotone variational inequalities
[AD-A147123] N85-16544
CALIBRATING
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Recalibration of the KPNO spot sensitometers — Kitt Peak National Observatory N85-16103
Extending magnitude standards to faint stars with a sub-beam prism N85-16124
Sub-beam prism used at the Bosscha Schmidt telescope N85-16125
Astronomers' problems with the calibration of Schmidt plates N85-16126
Stellar photographic photometry using a double wedge technique with a focal reducer system N85-16133
Six-component strain gage block scale 167-6B. Part 1: Calibration, September 1983
[F+W-FO-1699] N85-16143
NBS (National Bureau of Standards) switching radiometers
[PB84-235894] N85-16147
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5
[E85-10059] N85-16270
Research in geodesy based upon radio interferometric observations of extragalactic radio sources
[AD-A147581] N85-16280
Results of the 1984 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-174270] N85-16294
CALIFORNIA
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10044] N85-16244
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10053] N85-16249
LANDSAT-4 Thematic Mapper Modulation Transfer Function (MFT) evaluation — California and New Mexico
[E85-10055] N85-16250
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Image-to-image correspondence: Linear structure matching N85-16266
CAMERAS
Automatic camera tracking for remote manipulators
[DE85-001897] N85-16187
Improved radiographic viewing system
[AD-A147587] N85-16456
CANNING
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
CANOPIES
Deciduous forest radiation regimes: Effects of forest structure, phenology and Earth-Sun geometry upon their spatial, temporal and spectral variability
[AD-A146804] N85-16327
CANOPIES (VEGETATION)
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry
[E85-10040] N85-16241
Spectral estimators of absorbed photosynthetically active radiation in corn canopies
[E85-10041] N85-16242
Growth/reflectance model interface for wheat and corresponding model
[E85-10058] N85-16269
CAPACITORS
EMI (electromagnetic interference) filter capacitor unit
[AD-D011392] N85-15941
CARBAZOLES
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914
CARBON
Reciprocal solubility of phases in multi-component systems
[BLL-M-36003-(5828.4)] N85-15870
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase
[BLL-M-36023-(5828.4)] N85-15873
CARBON COMPOUNDS
Gas cooled fuel cell systems technology development
[NASA-CR-174732] N85-16291
CARBON DIOXIDE
A biological sensor for the detection of toxicants
[AD-D011304] N85-16141
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas
[AD-A147481] N85-16170
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry
[DE85-001272] N85-16406
CARBON DIOXIDE CONCENTRATION
The CSIRO (Australia) atmospheric carbon dioxide monitoring program: Surface data
[CSIRO-TP-6] N85-16324
The problem of climate and climate variation N85-16353
CARBON DIOXIDE LASERS
Silent discharge carbon dioxide gas laser machining facility
[BLL-CTO-2267-(9091.9F)] N85-16150
Remote sensing of atmospheric gases with CO2 lasers. Continuation and conclusion of spectroscopic investigations
[BMFT-FB-W-84-030] N85-16285
CARBON FIBER REINFORCED PLASTICS
Erosion-resistant nosetip construction
[AD-D011346] N85-15797
CARBON FIBERS
All-composite Airbus empennage N85-15931
Composite batteries N85-15932
CARBON MONOXIDE
The adsorption of CO and oxygen on Cu layers on a W(110) surface
[AD-A147345] N85-15847
CARBON 13
The 13C nuclear magnetic resonance in graphite intercalation compounds
[NASA-CR-174261] N85-16601
CARBON-CARBON COMPOSITES
Erosion-resistant nosetip construction
[AD-D011346] N85-15797
Carbon/carbon rocket motor exit cone reinforcement
[AD-D011360] N85-15799
Thermophysical property testing using transient techniques
[AD-A147085] N85-16664
CARDIOVASCULAR SYSTEM
Biochemical evaluation of bodily influence of high and low temperatures N85-16441
CARIBBEAN SEA
Review of climate problems in Latin America and the Caribbean N85-16354
CARRIER FREQUENCIES
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010
CARRIER TRANSPORT (SOLID STATE)
Application of the diffraction model to amorphous magnesium zinc alloys
[AD-A147369] N85-15863
CASCADE FLOW
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade
[NASA-TM-86914] N85-15689
A method for solving the inverse problem of transonic cascade flow
[AD-A146739] N85-15698
CASTING
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
Making high explosive bodies for shaped charges by casting or pressing. Shaped charge research at Research Institute of National Defence (FOA) in 1972 - 1983, part 1
[FOA-C-20554-D4-PT-1] N85-15923
CATALYSIS
Catalytic oxidation by transition metal ions in zeolites
[AD-A146828] N85-15842
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
CATALYSTS
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840

Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
CATHODE RAY TUBES
Matrix display simulation
[AD-D011371] N85-16695
CATHODES
Synthesis and properties of Hexachloromolybdates(5) and related species
[AD-A139599] N85-15852
Explosive emission cathode plasmas in intensive relativistic electron beam diodes
[AD-A147917] N85-16642
CATIONS
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory
[AD-A147161] N85-15844
CAUCHY PROBLEM
Self similar solutions for a degenerate Cauchy problem
[AD-A147241] N85-16548
CAULKING
Corrosion properties of second-generation conductive materials N85-16348
CAVITATION FLOW
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072
Study of optical sound generation and amplification
[AD-A147359] N85-16592
CAVITIES
Catalytic oxidation by transition metal ions in zeolites
[AD-A146828] N85-15842
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078
Numerical solutions for steady natural convection in a square cavity
[PB84-245752] N85-16090
CAVITY RESONATORS
Dual mode directionally coupled band reject filter apparatus
[AD-D011359] N85-15984
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095
CEILINGS (METEOROLOGY)
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F
[AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387
CELESTIAL GEODESY
Research in geodesy based upon radio interferometric observations of extragalactic radio sources
[AD-A147581] N85-16280
CELESTIAL NAVIGATION
Optimization of orientation in navigation by two heavenly bodies N85-16027
CELLS (BIOLOGY)
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422
CEMENTITE
Reciprocal solubility of phases in multi-component systems
[BLL-M-36003-(5828.4)] N85-15870
CEMENTS
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
CENTRAL AMERICA
Climate Conference for Latin America and the Caribbean
[WMO-632] N85-16352
Review of climate problems in Latin America and the Caribbean N85-16354
The climate in food production in Latin America N85-16359
Requirements for training in climate-related subjects N85-16378
Education and training for the climate related activities in Latin America and the Caribbean N85-16379
CENTRAL NERVOUS SYSTEM
Nicholet MED-80 (trademark) programs in the Naval Biodynamics Laboratory evoked potential series
[AD-A147105] N85-16451
CENTRAL PROCESSING UNITS
Atmospheric Modeling And Sensor Simulation (AMASS) study
[NASA-CR-171283] N85-16325
CENTRIFUGES
Investigations into the improvement of processing of Bolivian tin ores
[BMFT-FB-T-84-184] N85-15807
CERAMIC NUCLEAR FUELS
Inquiry into disintegration control of irradiated low enrichment uranium for high temperature gas cooled reactors
[OEFZS-7281] N85-16615
CERAMICS
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Oxidation resistance of silicon ceramics
[NASA-TM-77429] N85-15898
Moisture absorbing anti-arcing coating and method for applying same
[AD-D011310] N85-15004
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
Transformation toughened ceramics for the heavy duty diesel engine technology program
[NASA-CR-174689] N85-16698
CEREBELLUM
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
Specifics of dynamics of brain biopotentials under the influence of complex audible communicative signals N85-16440
CEREBRUM
Pathogenesis and treatment of cerebral air embolism and associated disorders
[AD-A146723] N85-16443
CHANNELS (DATA TRANSMISSION)
Systems study for an integrated Digital-Electric Aircraft (IDEA)
[NASA-CR-3840] N85-15714
CHAOS
Chaos near the Coulomb Barrier: Nuclear molecules
[DE85-001280] N85-16608
CHARGE CARRIERS
Determination of parameters of doped thin semiconductor layers from plasmatic minimum of reflection coefficient for infrared radiation N85-16047
CHARGE COUPLED DEVICES
Study of alternate optical and fine guidance sensor designs for the space infrared telescope facility (SIRTF)
[NASA-CR-166614] N85-15794
CHARGED PARTICLES
Earth's radiation belts
[AD-A147927] N85-16339
CHARTS
A program to produce standard shewhart control charts for the statistics X-bar and R or S, P, NP, C, or U
[AD-A146971] N85-16501
CHECKOUT
Debug testing and confidence testing
[AD-A147104] N85-16504
CHEMICAL ANALYSIS
The influence of sample collection and methods of analysis on chemical concentrations measured in rainwater
[KNMI-TR-55] N85-15853
Coso Monitoring Program, January 1981 through December 1983
[AD-A147894] N85-16338
CHEMICAL BONDS
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850
CHEMICAL COMPOSITION
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
Gradient polymers
[AD-A146838] N85-15900
CHEMICAL EQUILIBRIUM
Computer program for calculation of complex chemical equilibrium compositions and applications. Supplement 1: Transport properties
[NASA-TM-86885] N85-16683
CHEMICAL LASERS
Delta wing nozzle assembly for chemical lasers
[AD-D011396] N85-16158
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
CHEMICAL REACTIONS
Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods
[NASA-TM-86923] N85-15726
Influence of temperatures of reactants on nature of product of solid-phase reactions
[BLL-M-36019-(5828.4)] N85-15832
Laser spectroscopy of alkali atom-tetrahaloethylene reactions
[AD-A147431] N85-15848
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850
Thio and seleno compounds of the transition metals with the d (o) configuration
[BLL-MINTEK-TR-1177-(5610.5759)] N85-15883
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
Performance and cost of energy transport and storage systems for dish applications using reversible chemical reactions
[NASA-CR-174263] N85-16298
CHEMILUMINESCENCE
Laser spectroscopy of alkali atom-tetrahaloethylene reactions
[AD-A147431] N85-15848
CHEMISORPTION
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15848
CHIPS (ELECTRONICS)
Charge domain filters for enhanced monolithic signal processing
[AD-A147428] N85-15964
CHIPS (MEMORY DEVICES)
Compository speech output (KOSA) with a very large scale integration speech synthesis chip
[FI-13-TBR-18] N85-15074
CHLOROETHYLENE
Fate and disposition of trichloroethylene in surface soils
[AD-A147918] N85-16321
CHLOROSILANES
Silazane precursors to silicon nitride
[AD-A146791] N85-15889
CHROMIUM
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
CHROMIUM ALLOYS
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36028-(5828.4)] N85-15855
On heat-treatable copper-chromium alloy, 1
[NASA-TM-77753] N85-15879
CHROMIUM OXIDES
Interaction between chromium oxide and carbon
[BLL-M-36002-(5828.4)] N85-15867
CHROMOSPHERE
Spicules and surges
[AD-A146785] N85-16727
CIRCUIT PROTECTION
The ac power line protection for an IEEE 587 Class B environment N85-16347
CIRCUITS
The replacement of precious metal thick film inks using conductive polymer technology. Phase 1: Feasibility study
[AD-A147814] N85-15913
CIRCULATION
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update
[AD-A146966] N85-15661
CITIES
Detecting agricultural to urban land use change from multi-temporal MSS digital data --- Salt Lake County, Utah
[E85-10049] N85-16245
Image variance and spatial structure in remotely sensed scenes --- South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16255
CIVIL AVIATION
Design study of technology requirements for high performance single-propeller-driven business airplanes
[NASA-CR-3863] N85-15692
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16687
CL-41 AIRCRAFT
TUTOR (CL-41A) tail flight load survey N85-15678
CLAMPS
A metallographic investigation of rotating bands for 7.5 cm artillery projectiles
[FOA-C-20551-D2] N85-15888
CLASSIFICATIONS
Estimating location parameters in a mixture N85-16252

Texture classification using autoregressive filtering N85-16254

CLEANING

Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings [NASA-CR-174274] N85-16296

CLEARINGS (OPENINGS)

Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica [E85-10051] N85-16247

CLIMATE

Climate Conference for Latin America and the Caribbean [WMO-632] N85-16352

The problem of climate and climate variation N85-16353

Review of climate problems in Latin America and the Caribbean N85-16354

Climate applications: General N85-16355

Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356

Climate and climate data. Report on the workshop held in Brasilia (Argentina) from 11-15 April 1983 N85-16357

The climate in food production in Latin America N85-16359

The challenge of food production: The importance of climate N85-16361

Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365

Climate and water quality N85-16368

The water balance and climate — Amazon region N85-16370

The potential contributions of the World Climate Program (WCP) to the economies of developing countries N85-16371

Socio-economic impact of climate — Mexico N85-16372

Climate and fisheries: A Peruvian case study N85-16373

Energy and climate: Problems in Latin America N85-16375

Requirements for training in climate-related subjects N85-16378

Education and training for the climate related activities in Latin America and the Caribbean N85-16379

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F [AD-A146913] N85-16384

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F [AD-A146915] N85-16386

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F [AD-A146916] N85-16387

Limited surface observations climatic summary (LISOCS). Hohenfels, AAF, West Germany [AD-A147167] N85-16393

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Offutt AFB, Nebraska, parts A-F [AD-A147183] N85-16394

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Hill AFB, Utah, parts A-F [AD-A147184] N85-16395

Interrelationship of atmospheric parameters in Honduras [AD-A147371] N85-16401

Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry [DE85-001272] N85-16406

CLIMATOLOGY

Climatological information and water resources N85-16367

Water and climate, study of one case N85-16369

The Amazon and climate N85-16376

A microprocessor data system for developing countries — climatology N85-16377

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F [AD-A147166] N85-16392

CLOSED CYCLES

Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines [NASA-CR-168222] N85-16300

CLOSED ECOLOGICAL SYSTEMS

Problems associated with the utilization of algae in bioregenerative life support systems [NASA-CR-166615] N85-16469

Algal culture studies related to a Closed Ecological Life Support System (CELSS) [NASA-CR-177322] N85-16470

Controlled ecological life support system higher plant flight experiments [NASA-CR-177323] N85-16471

Control and modeling of a CELSS (Controlled Ecological Life Support System) [NASA-CR-177324] N85-16472

Feasibility of producing a range of food products from a limited range of undifferentiated major food components [NASA-CR-177329] N85-16473

CLOUD COVER

Conditions governing the formation of stratocumulus clouds over the western Atlantic during cold air outbreaks [AD-A146780] N85-16383

CLOUDS (METEOROLOGY)

Atmospheric environment for Space Shuttle (STS-41G) launch [NASA-TM-86486] N85-16320

CLUSTER ANALYSIS

Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260

Local dependence and point processes of exceedances in stationary sequences [AD-A147859] N85-16578

CLUTTER

Rivista Tecnica Selenia, volume 9, number 1 N85-15845

Reference oscillator stability effect on clutter cancellation in a radar system N85-15946

Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program [AD-A146771] N85-15951

CMOS

Development of a 2 micrometer silicon-gate-CMOS-technology for microcomputer oriented VLSI circuits with a supply voltage range between 1.5 and 5 V [BMFT-FB-T-84-203] N85-16012

CNOIDAL WAVES

An analytical model of periodic waves in shallow water [AD-A147501] N85-16085

An analytical model of periodic waves in shallow water [AD-A147502] N85-16086

COAL UTILIZATION

USSR report: Energy [JPRS-UEN-84-038] N85-16312

COASTAL CURRENTS

Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current [AD-A147910] N85-16282

COASTAL ZONE COLOR SCANNER

Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner [AD-A147909] N85-16281

COASTS

Conditions governing the formation of stratocumulus clouds over the western Atlantic during cold air outbreaks [AD-A146780] N85-16383

COATINGS

Deposition of titanium nitride coatings by reactive evaporation and electrically activated reactive evaporation [BLL-TRANS-5043-(9091.9F)] N85-15858

Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C [NASA-CR-174837] N85-15895

Moisture absorbing anti-arcing coating and method for applying same [AD-D011310] N85-15904

Damping capacity of multilayer tube during torsion [BLL-M-36011-(5828.4)] N85-16202

Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings [NASA-CR-174274] N85-16296

Corrosion properties of second-generation conductive materials N85-16348

Optical fibers with reduced pressure sensitivity to high frequency acoustic field [AD-D011306] N85-16627

COBALT

The growth of metastable peritectic compounds [NASA-CR-171289] N85-15824

CODE DIVISION MULTIPLE ACCESS

Distributed reservation-based code division multiple access [AD-A147007] N85-15957

CODERS

ILIR task of digital recoil travel measurement system [AD-A147102] N85-16140

CODING

Techniques for vector quantization [AD-A147052] N85-16539

COGENERATION

Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines [NASA-CR-168222] N85-16300

COGNITION

Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] N85-16474

COHERENT ELECTROMAGNETIC RADIATION

Transmission line biased coherent array of Josephson oscillators [AD-D011323] N85-15979

A new free electron laser using a relativistic beam with spiralling electron [AD-D011318] N85-16165

COLD ACCLIMATIZATION

Effects of restricted water intake on performance in a cold environment [AD-A146904] N85-16450

COLD FRONTS

Conditions governing the formation of stratocumulus clouds over the western Atlantic during cold air outbreaks [AD-A146780] N85-16383

COLD WATER

Comparison of thermal responses between rest and leg exercise in water [AD-A146818] N85-16448

COLD WORKING

On heat-treatable copper-chromium alloy, 1 [NASA-TM-77753] N85-15879

COLLIMATORS

Apparatus for determining the liquid water content of a gas [AD-D011297] N85-15839

COLLISION AVOIDANCE

A bird strike handbook for base-level managers [AD-A147926] N85-16008

COLLISIONAL PLASMAS

A propagator expansion method for solving linearized plasma kinetic equations with collisions [AD-A147524] N85-16640

COLLISIONS

An operator method for computing the asymptotics of a collision resolution interval [AD-A146837] N85-16528

COLOMBIA

Use of minicomputers for the formation of hydrological data banks N85-16358

COLOR

New technology high efficiency and high stability color motion video compression system [AD-A147523] N85-15968

COLOR PHOTOGRAPHY

Some nonatlas work at the European Southern Observatory (ESO) Sky Atlas Laboratory — astronomical photography N85-16117

Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner [AD-A147909] N85-16281

COMBUSTION

Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods [NASA-TM-86923] N85-15726

The structure of dilute combusting sprays [NASA-CR-174838] N85-15728

COMBUSTION CHAMBERS

The structure of dilute combusting sprays [NASA-CR-174838] N85-15728

Verification of life prediction through component testing N85-15748

Integral boost, heat protection, port covers and transition N85-15813

Combustion chamber floatwall panel attachment arrangement [AD-D011358] N85-16647

COMBUSTION PRODUCTS

Mechanism of soot formation [AD-A146817] N85-15841

COMMAND AND CONTROL

Human factors characteristics of the Joint Tactical Fusion Test Bed: Field test 467 results [AD-A146856] N85-16476

Acquisition planning at the Defense Communications Agency [AD-A146877] N85-16669

A simulator for determining the performance of transaction manager and lock manager combinations in a database [AD-A147827] N85-16696

COMMODITIES
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819

COMMUNICATION
Space infrastructure N85-15783
An analysis of constraints to coordinated tactical crew interaction in the P-3C aircraft
[AD-A147220] N85-16478

COMMUNICATION EQUIPMENT
The Western Aeronautical Test Range of NASA Ames Research Center
[NASA-TM-85924] N85-15756

COMMUNICATION NETWORKS
Hardwire missile receiver coupler
[AD-D011350] N85-15936
Distributed reservation-based code division multiple access
[AD-A147007] N85-15957
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer
[AD-A147438] N85-15965

COMMUNICATION SATELLITES
NOAA (National Oceanic and Atmospheric Administration) Aircraft Satellite Data Link (ASDL)
[PB84-243773] N85-15976

COMPACTING
Solid-phase sintering of tantalum carbide
[BLL-M-36013-(5828.4)] N85-15872

COMPARISON
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
Comparison measurements on optical particle counters
[BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
Comparative investigation of three commercial radiosonde systems
[KNMI-TR-53] N85-16409
Can the Aggressors continue to be effective in the F-5E?
[AD-A146861] N85-16465

COMPENSATORS
Tracking servo compensator with rate aiding
[AD-D011372] N85-15971
Dynamic polymer pressure transducer with temperature compensation
[AD-D011373] N85-16142

COMPILERS
Ada compiler validation summary report: New York University (NYU Ada/Ed) compiler, version 1.4 for VAX 11/780, using VMS 3.5
[AD-A146924] N85-16483
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a for Sun 120 Motorola M68010, using 4.2 BSD UNIX-Sun Version 1.1
[AD-A146925] N85-16484
NYU Ada/Ed user's guide: Version 1.4 for VAX/VMS systems
[AD-A146759] N85-16495
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a2 for Callan Unistar 300, using System V, version 4.1a
[AD-A147115] N85-16505

COMPLEX COMPOUNDS
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902

COMPLEX VARIABLES
Existence and non-uniqueness of similarity solutions of a boundary layer problem
[NASA-CR-172503] N85-16064
Bootstrap confidence intervals
[AD-A147572] N85-16559

COMPONENT RELIABILITY
Engine cyclic durability by analysis and material testing N85-15744
Bearing tester fit analysis
[NASA-CR-171282] N85-16181

COMPOSITE MATERIALS
Optical properties of composite materials
[AD-A146768] N85-15826
All-composite Airbus empennage N85-15931
Composite batteries N85-15932

COMPOSITE STRUCTURES
Evaluation of the alkaline peroxide pre-bond surface treatment for titanium
[AD-A147352] N85-15881

COMPOSITION (PROPERTY)
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824
Properties of miscible polymer blends
[AD-A147090] N85-15903

COMPRESSIBILITY
Influence of pressure on compaction during compression of powders of iron and 40Kh and 10R6MS steels
[BLL-M-35995-(5828.4)] N85-15866

COMPRESSIBLE FLUIDS
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590

COMPRESSION LOADS
Computer program for determining induced stresses and consolidation settlements (CSETT)
[AD-A146730] N85-16493

COMPRESSIVE STRENGTH
Mechanical property data 7050-t736511 alloy
[AD-A147365] N85-15882
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909

COMPRESSOR ROTORS
Problems and possibilities for life extension in gas turbine components N85-15742

COMPRESSORS
Verification of life prediction through component testing N85-15748

COMPUTATION
Research in applied mathematics, numerical analysis, and computer science
[NASA-CR-172505] N85-16480
Sequential and parallel matrix computations
[AD-A147871] N85-16562
Structural optimization and other large-scale processes
[AD-A147895] N85-16564
Efficient computation of optimal time for transaction processing in a database system
[AD-A147568] N85-16693

COMPUTATIONAL CHEMISTRY
Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods
[NASA-TM-86923] N85-15726

COMPUTATIONAL FLUID DYNAMICS
Supersonic nonlinear potential analysis
[NASA-CR-172456] N85-15685
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
Current problems in turbomachinery fluid dynamics
[AD-A147127] N85-16074

COMPUTER AIDED DESIGN
Control system design language implementation of a gas turbine starting controller
[AD-A147896] N85-15732
The design of high order active RC-filters
[DRIC-T-7147] N85-15987
Trends in development of software for computer-aided analysis of large-scale integrated circuits N85-16055
Program visualization: Graphics support for software development
[AD-A146867] N85-16499
The reactor dynamic code RETRANS: Structure and users guide
[OEFZS-4287] N85-16814

COMPUTER GRAPHICS
Nonparametric analysis of Minnesota spruce and aspen tree data and LANDSAT data N85-16253
Research activities of the Norwegian seismic array (NORSAR)
[AD-A146778] N85-16326
Interactive Signal Analysis Software (ISAS). User's manual
[AD-A146999] N85-16485
Program visualization: Graphics support for software development
[AD-A146867] N85-16499
A program to produce standard shewhart control charts for the statistics X-bar and R or S, P, NP, C, or U
[AD-A146971] N85-16501
Interactive color-graphics interface for energy monitoring and control systems
[AD-A147538] N85-16509
PLOT3D: An interactive graphics code for 3-dimensional plots
[AD-A147887] N85-16514
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521

COMPUTER NETWORKS
Upper Atmosphere Research Satellite (UARS) trade analysis
[NASA-CR-175269] N85-15774
Support for distributed transactions in the TABS (Transaction based systems) prototype
[AD-A147213] N85-16486
NSW (National Software Works) lessons learned
[AD-A146737] N85-16494
Reliability analysis of local area networks, intermediate report
[BLL-WH-610-(9091.9F)] N85-16520
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521

COMPUTER PROGRAM INTEGRITY
Formal verification of mathematical software
[NASA-CR-172407] N85-16489

COMPUTER PROGRAMMING
Art of programming programmable microcalculators. Part 12: Solution of differential equations N85-16043
RATFOR user's guide version 2.0
[NASA-CR-166601] N85-16490
Program visualization: Graphics support for software development
[AD-A146867] N85-16499
Functional semantics of modules
[AD-A146923] N85-16500
The electronic typesetting program programmer's manual
[AD-A147500] N85-16508
Implementation of a constraint machine for prism - A parallel problem solver
[AD-A147844] N85-16512
Operating system versus programming environment, for example the UNIX
[SWA-84/037] N85-16518
Trust region methods for minimization
[AD-A147073] N85-16540

COMPUTER PROGRAMS
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
NyKINM, a further development of KINM 22 — simulation of a robot attack on an aircraft
[FOA-C-20559-D6(E3)] N85-15720
Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods
[NASA-TM-86923] N85-15726
A computer program for the performance analysis of scarfed nozzles
[AD-A147370] N85-15730
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual — rocket nozzle and orbital plume flow fields
[NASA-CR-171828] N85-15803
A study of interply layer effects on the free-edge stress field of angleplied laminates
[NASA-TM-86924] N85-15822
Bearing tester fit analysis
[NASA-CR-171282] N85-16181
Research activities of the Norwegian seismic array (NORSAR)
[AD-A146778] N85-16326
Computer program to compute soil thermal conductivity from transient temperature measurements
[PB85-100550] N85-16341
Upset susceptibility study employing circuit analysis and digital simulation — digital systems and electromagnetic interference N85-16344
Random pattern tracking acceleration tolerance tester
[AD-D011404] N85-16459
Formal verification of mathematical software
[NASA-CR-172407] N85-16489
Computer program for determining induced stresses and consolidation settlements (CSETT)
[AD-A146730] N85-16493
A program to produce standard shewhart control charts for the statistics X-bar and R or S, P, NP, C, or U
[AD-A146971] N85-16501
The effects of software quality control and baseline management on the acquisition of computer programs
[AD-A147051] N85-16502
NOISEMAP 4.4 computer program update, operator's manual, addendum 1
[AD-A147091] N85-16503
Debug testing and confidence testing
[AD-A147104] N85-16504
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
A survey and evaluation of software quality assurance
[AD-A147552] N85-16510
On the structure of information in software
[AD-A147580] N85-16511
PLOT3D: An interactive graphics code for 3-dimensional plots
[AD-A147887] N85-16514
FORTRAN version of the quantitative energy-dispersive electron beam X-ray analysis program FRAME C
[PB84-240936] N85-16519
Extracting embedded generalized networks from linear programming problems
[AD-A147565] N85-16558
Arctic marine acoustics
[AD-A147492] N85-16584

Computer program for calculation of complex chemical equilibrium compositions and applications. Supplement 1: Transport properties
[NASA-TM-86885] N85-16683
Data base support for SIO (System Integration Office)
[AD-A147487] N85-16692

COMPUTER STORAGE DEVICES
Electromechanical switch
[AD-D011400] N85-16009
An algorithm for assembly of stiffness matrices into a compacted data structure
[AD-A146727] N85-16492

COMPUTER SYSTEMS DESIGN
The Torun measuring system for astronomical spectra N85-16130
Support for distributed transactions in the TABS (Transaction based systems) prototype
[AD-A147213] N85-16486

COMPUTER SYSTEMS PERFORMANCE
Human factors characteristics of the Joint Tactical Fusion Test Bed: Field test 467 results
[AD-A146856] N85-16476

COMPUTER SYSTEMS PROGRAMS
SENSIT.FOR: A program for sensitometric reduction N85-16105
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10044] N85-16244
On the structure of information in software
[AD-A147580] N85-16511
Operating system versus programming environment, for example the UNIX
[SWA-84/037] N85-16516
Austrian contributions to fuel rod failure models shown at the International Standard Problem (ISP)-14
[OEFZS-4276] N85-16613

COMPUTER TECHNIQUES
Automated Lavina collects data on snow N85-16224
Alabama Tin Belt: Metallogeneels and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283
Research in applied mathematics, numerical analysis, and computer science
[NASA-CR-172505] N85-16480
NSW (National Software Works) lessons learned
[AD-A146737] N85-16494
Ada training curriculum. Real-time systems in Ada I401 teacher's guide, volume 1
[AD-A146782] N85-16496
Ada training curriculum. Real-time systems in Ada I401 teacher's guide, volume 2
[AD-A146783] N85-16497
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521
Ion microscopy of metals and semiconductors
[AD-A147118] N85-16626
Manual and automated line generalization and feature displacement: Appendixes
[AD-A143251] N85-16689
Distributed knowledge base systems for diagnosis and information retrieval
[AD-A146890] N85-16690

COMPUTER VISION
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa)
[AD-A147890] N85-16458
JPL Robotics Laboratory computer vision software library
[NASA-CR-174272] N85-16491

COMPUTERIZED SIMULATION
A Q-GERT network simulation model for examining pipeline time in the Navy's J-52 intermediate level jet engine repair cycle
[AD-A147269] N85-15683
On the generation of random variables for radar simulation purposes N85-15947
An interactive FORTRAN program for determining reliability of pseudo-range geodetic point positioning using the global positioning system
[AD-A147133] N85-16275
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
Interaction of human cognitive models and computer based models in supervisory control
[AD-A142547] N85-16474
Convection schemes for use with curvilinear coordinate systems: A survey
[AD-A147093] N85-16543
A simulation model for Air Launched Cruise Missile engine management
[AD-A147016] N85-16572

COMPUTERS
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929
Eyes for computers N85-16428
Computer science research in Europe
[AD-A146905] N85-16482
Research and technology, 1984 report
[NASA-TM-83096] N85-16730

CONCENTRATION (COMPOSITION)
The influence of sample collection and methods of analysis on chemical concentrations measured in rainwater
[KNMI-TR-55] N85-15853

CONCRETE STRUCTURES
Finite element procedures applicable to nonlinear analysis of reinforced concrete shell structures
[AD-A146796] N85-16209

CONCRETES
Salt action on concrete
[AD-A147812] N85-15912
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures
[PB85-100949/GAR] N85-15918

CONDENSERS (LIQUEFIERS)
Heat transfer due to film condensation on vertical fluted tubes
[AD-A147258] N85-16079

CONDUCTIVE HEAT TRANSFER
New aspects of thermoelastic contact
[AD-A147554] N85-16217

CONDUCTORS
Corrosion properties of second-generation conductive materials N85-16348

CONFERENCES
Proceedings of the International Conference and Exposition on Structural Impact and Crashworthiness
[AD-A147845] N85-15703
Engine Cyclic Durability by Analysis and Testing
[AGARD-CP-368] N85-15733
Modern signal processing and reconnaissance — conferences
[FOA-C-30374-E1] N85-15975
Astronomical photography 1984 — conferences
[ROE-OR-14] N85-16102
Proceedings of the Second Annual Symposium on Mathematical Pattern Recognition and Image Analysis Program
[E85-10056] N85-16251
International Aerospace and Ground Conference on Lightning and Static Electricity. 1984 technical papers. Supplement
[NASA-CP-2356] N85-16343
Climate Conference for Latin America and the Caribbean
[WMO-632] N85-16352
QUASAT: A VLBI observatory in space — conferences
[ESA-SP-213] N85-16700

CONFIDENCE
Bootstrap confidence intervals
[AD-A147572] N85-16559

CONFIDENCE LIMITS
The theory of optimal confidence limits for systems reliability with counterexamples for results on optimal confidence limits for series systems
[AD-A147236] N85-16546
Bootstrap confidence intervals
[AD-A147572] N85-16559

CONFIGURATIONS
Changes in spectral properties of detached leaves
[E85-10042] N85-16243

CONGRESSIONAL REPORTS
Man in Space: National Historic Landmark Theme Study
[PB85-107233/GAR] N85-15768
Civilian space stations and the US future in space
[OTA-STI-241] N85-15781

CONICAL NOZZLES
Carbon/carbon rocket motor exit cone reinforcement
[AD-D011360] N85-15799

CONJUGATE GRADIENT METHOD
Solution of finite element problems by preconditioned conjugate gradient and Lanczos methods
[AD-A146921] N85-16532

CONSERVATION EQUATIONS
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15801

CONSOLIDATION
Computer program for determining induced stresses and consolidation settlements (CSETT)
[AD-A146730] N85-16493

CONSTRAINTS
Implementation of a constraint machine for prism - A parallel problem solver
[AD-A147844] N85-16512
Trust region methods for minimization
[AD-A147073] N85-16540

CONSTRICTIONS
Test your contacts by measuring their constriction resistance
[BLL-WH-611-(9091.9F)] N85-15978

CONTACT RESISTANCE
Test your contacts by measuring their constriction resistance
[BLL-WH-611-(9091.9F)] N85-15978

CONTAMINANTS
Fate and disposition of trichloroethylene in surface soils
[AD-A147918] N85-16321

CONTAMINATION
Gas contamination detection device
[AD-D011386] N85-15833
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines
[AD-A147092] N85-16073
Assessment of radiation dosages obtained by intake of radioactive fallout contaminated food
[VTT-292] N85-16460

CONTINENTAL SHELVES
Maritime prospecting, mining discussed N85-16226

CONTINUITY
Viscosity solutions of Hamilton-Jacobi equations at the boundary
[AD-A147444] N85-16553
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560

CONTINUITY (MATHEMATICS)
Continuity of the null space basis and constrained optimization
[AD-A147038] N85-16538

CONTINUOUS WAVE RADAR
Design of an analog spectrum analyzer for probing experiments
[AD-A147384] N85-15983

CONTINUUM MECHANICS
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields
[AD-A146854] N85-16602

CONTOURS
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083

CONTRACT MANAGEMENT
Technical performance measurement handbook
[AD-A147314] N85-16675
An appraisal of the USAF Technology Modernization Program
[AD-A147344] N85-16677
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684

CONTRACTORS
Contractor productivity measurement
[AD-A146756] N85-16666
An appraisal of the USAF Technology Modernization Program
[AD-A147344] N85-16677
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681

CONTRACTS
Contractor productivity measurement
[AD-A146756] N85-16666
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684

CONTROL
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487

CONTROL STICKS
Biodynamic resistant control stick
[AD-D011380] N85-15721

CONTROL THEORY
Determination of row-and-column control principle of phase antenna array from amplitude-phase distribution of field in aperture N85-16033
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178

Control and modeling of a CELSS (Controlled Ecological Life Support System)
[NASA-CR-177324] N85-16472
Numerical methods and approximation and modelling problems in stochastic control theory
[AD-A146927] N85-16533
CONTROLLED ATMOSPHERES
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773
CONTROLLERS
Control system design language implementation of a gas turbine starting controller
[AD-A147896] N85-15732
Flutter control with unsteady aerodynamic models
[AD-A147858] N85-15753
Battery control and fault detection method
[AD-D011384] N85-16307
Interactive color-graphics interface for energy monitoring and control systems
[AD-A147538] N85-16509
Mirror actuator control system
[AD-D011383] N85-16619
CONVECTION
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825
Finite difference calculations of buoyant convection in an enclosure. Part 2: Verification of the nonlinear algorithm
[PB85-104065/GAR] N85-16089
Numerical solutions for steady natural convection in a square cavity
[PB84-245752] N85-16090
Convection schemes for use with curvilinear coordinate systems: A survey
[AD-A147093] N85-16543
CONVECTIVE FLOW
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078
CONVECTIVE HEAT TRANSFER
Convection heat transfer in the critical region of fluid mixtures
[DE85-002116] N85-16086
Methods for heat transfer and temperature field analysis of the insulated diesel
[NASA-CR-174783] N85-16699
CONVERGENT-DIVERGENT NOZZLES
A computer program for the performance analysis of scarfed nozzles
[AD-A147370] N85-15730
COOLING SYSTEMS
Cooling system investigation of the 3-kW MEP models 016A, 021A, and 026A (60Hz, 400-Hz and 28-V dc) gasoline-engine-driven generator sets
[AD-A147571] N85-16185
COORDINATE TRANSFORMATIONS
Automatic camera tracking for remote manipulators
[DE85-001897] N85-16187
COORDINATES
Use of coordinate functions to calculate deformation fields
[BLL-M-36010-(5828.4)] N85-16524
COPOLYMERS
Properties of miscible polymer blends
[AD-A147090] N85-15903
Synthesis and characterization of unique liquid crystalline block copolyesters. A proposal for a polymer research center at the Atlanta University
[AD-A147280] N85-15907
New synthesis of phosphazene polymers
[AD-A147567] N85-15910
COPPER
The adsorption of CO and oxygen on Cu layers on a W(110) surface
[AD-A147345] N85-15847
COPPER ALLOYS
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
On heat-treatable copper-chromium alloy, 1
[NASA-TM-77753] N85-15879
CORN
Spectral estimators of absorbed photosynthetically active radiation in corn canopies
[E85-10041] N85-16242
CORONARY CIRCULATION
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
CORRECTION
Wind sheltering correction — anemometry
[KNMI-TR-52] N85-16408
CORRELATION
Analysis of subpixel registration N85-16267
CORRELATORS
An automatic pattern recognition apparatus
[AD-D011319] N85-16628
Correlator and data processing requirements for QUASAT N85-16709
Processing system for space VLBI N85-16711
CORROSION
Mechanical aspects of high temperature coatings N85-15749
Corrosion study on zirconium refractory coatings. 1: Oxidation of zirconium nitride coatings by oxygen
[BLL-RISLEY-TR-5044-(9091.9F)] N85-15857
Surface effects of corroeive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896
Salt action on concrete
[AD-A147812] N85-15912
CORROSION RESISTANCE
Improvement of the corrosion resistance of turbine engine bearings
[AD-A147430] N85-15731
Corrosion properties of second-generation conductive materials N85-16348
CORROSION TESTS
Testing of non-alloyed and low-alloyed steels for their behaviour with respect to intercrystalline stress corrosion cracking
[BLL-RISLEY-TR-4546-(9091-9F)] N85-15861
COS-B SATELLITE
The galactic gamma-ray distribution: Implications for galactic structure and the radial cosmic ray gradient
[NASA-TM-86173] N85-16729
COSMIC RAYS
The calibration of photographic and spectroscopic films: A densitometric analysis of IIaO film flown aboard the Space Shuttle 3
[NASA-CR-174278] N85-16101
The galactic gamma-ray distribution: Implications for galactic structure and the radial cosmic ray gradient
[NASA-TM-86173] N85-16729
COST ANALYSIS
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718
More than you want to know about maximum likelihood estimation
[NASA-TM-85905] N85-15752
The effect of assumptions about cost element probability distributions on operating and support cost risk analysis
[AD-A147553] N85-16576
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681
COST EFFECTIVENESS
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718
COST ESTIMATES
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
A buyer's guide to space infrastructure N85-15784
Performance and cost of energy transport and storage systems for dish applications using reversible chemical reactions
[NASA-CR-174263] N85-16298
The effect of assumptions about cost element probability distributions on operating and support cost risk analysis
[AD-A147553] N85-16576
COSTA RICA
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica
[E85-10051] N85-16247
COSTS
Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements N85-15790
An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement
[AD-A147496] N85-16678
COULOMB COLLISIONS
Chaos near the Coulomb Barrier: Nuclear molecules
[DE85-001280] N85-16608
COUNTERS
Safety evaluation of an electronic totalizer containing a Li/(CF)x cell
[AD-A147306] N85-16305
COUPLING
Application of quantum chemistry of atmospheric chemistry
[AD-A147035] N85-15843
COUPLINGS
Improvement of gas-tightness of OTTG and TBO-5 threaded pipe couplings
[BLL-M-35993-(5828.4)] N85-16175
Flexible line support assembly
[AD-D011391] N85-16177
COVARIANCE
An interactive FORTRAN program for determining reliability of pseudo-range geodetic point positioning using the global positioning system
[AD-A147133] N85-16275
Estimation for a semimartingale regression model using the method of sieves
[AD-A146809] N85-16527
Local likelihood estimation
[AD-A147317] N85-16571
A factor analysis for time series
[AD-A147495] N85-16574
COVERINGS
Integral boost, heat protection, port covers and transition N85-15613
CRACK INITIATION
Comparative investigation of testing methods to determine hot crack susceptibility during welding
[BAM-ERP-2415] N85-16218
Influence of constant amplitude and variable amplitude loading on crack initiation and micro crack propagation in Al 2024-T3
[DFVLR-FB-84-29] N85-16220
The effect of the test atmosphere on the formation and propagation of creep cracks in commercial high temperature alloys
[JUEL-1939] N85-16221
CRACK PROPAGATION
Inconel 718 alloy resistance to crack propagation N85-15740
Cumulative damage modeling of fatigue crack growth N85-15741
Corrosion fatigue crack growth rates of weldments in QIN steel
[AMTE(M)-R-83003] N85-15770
Thermal-mechanical fatigue crack growth in Inconel X-750
[NASA-CR-174740] N85-15877
Possibilities for a more accurate life prediction of components — gas turbine disks N85-16198
Investigation of the HPFTP first stage impeller crack
[NASA-CR-171281] N85-16208
A hydrogen partitioning model for hydrogen assisted crack growth
[AD-A147385] N85-16214
Influence of constant amplitude and variable amplitude loading on crack initiation and micro crack propagation in Al 2024-T3
[DFVLR-FB-84-29] N85-16220
The effect of the test atmosphere on the formation and propagation of creep cracks in commercial high temperature alloys
[JUEL-1939] N85-16221
CRACKS
Cumulative damage modeling of fatigue crack growth N85-15741
Problems and possibilities for life extension in gas turbine components N85-15742
Disc fatigue life predictions for gas turbine engines N85-15743
A general theory of circuit analogy in fracture diagnosis
[AD-A147177] N85-16212
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
CRASHES
Establishment of posture and working movements of pilot in air crash enquiries N85-16417
CRASHWORTHINESS
Proceedings of the International Conference and Exposition on Structural Impact and Crashworthiness
[AD-A147845] N85-15703
CRATONS
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272
Synthesis of proterozoic data as a prerequisite for tectonic and thermal modeling
[NASA-CR-174252] N85-16323
CREEP PROPERTIES
Study of residual stresses introduced into TA6ZrD (685) cylinders by quenching
[BLL-PNR-90240-(8019.3153)] N85-15859
Investigation of the creep behaviour of soft soldered joints with solder L-SnAg5 at ambient temperature
[BLL-T8383/BG/WH798/84] N85-15865
Back stress in dislocation creep. Part 1: Basic concepts and measuring techniques
[NASA-TM-77773] N85-16206
CREEP RUPTURE STRENGTH
Inconel 718 alloy resistance to crack propagation N85-15740
CREEP TESTS
The effect of the test atmosphere on the formation and propagation of creep cracks in commercial high temperature alloys
[JUEL-1939] N85-16221

CREW STATIONS
Display Techniques for Advanced Crew Stations (DTACS). Phase 1: Display techniques study
[AD-A146922] N85-15722
CREW WORK STATIONS
An analysis of constraints to coordinated tactical crew interaction in the P-3C aircraft
[AD-A147220] N85-16478
CREWS
A crew exposure study. Volume 1: Offshore
[AD-A146884] N85-16449
CROCCO METHOD
Existence and non-uniqueness of similarity solutions of a boundary layer problem
[NASA-CR-172503] N85-16064
CROP GROWTH
Spectral estimators of absorbed photosynthetically active radiation in corn canopies
[E85-10041] N85-16242
Growth/reflectance model interface for wheat and corresponding model
[E85-10058] N85-16269
Controlled ecological life support system higher plant flight experiments
[NASA-CR-177323] N85-16471
CROP INVENTORIES
Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260
CROSS CORRELATION
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174286] N85-16639
CROSSLINKING
Gradient polymers
[AD-A146836] N85-15900
CRUISE MISSILES
A simulation model for Air Launched Cruise Missile engine management
[AD-A147018] N85-16672
CRYOGENIC FLUID STORAGE
Risks in the transport and storage of liquefied natural gas. Sub-project 5-2: Investigation into building damage
[BLL-RISLEY-TR-4608-(9091.9F)] N85-15926
CRYOGENIC WIND TUNNELS
Description of the insulation system for the Langley 0.3-Meter Transonic Cryogenic Tunnel
[NASA-TM-86274] N85-15755
CRYOGENICS
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793
Cryogenic glass-to-metal seal
[AD-D011370] N85-15911
Study of infrared atmospheric emission
[AD-A147517] N85-16336
Research and technology, 1984 report
[NASA-TM-83096] N85-16730
CRYSTAL DEFECTS
Defective nature of the crystalline lattice of nickel ferrite-based solid solutions
[BLL-WH-595-(9091.9F)] N85-16645
CRYSTAL DISLOCATIONS
Back stress in dislocation creep. Part 1: Basic concepts and measuring techniques
[NASA-TM-77773] N85-16206
CRYSTAL GROWTH
Float zone experiments in space
[NASA-CR-171284] N85-15766
Crystal growth and characterization of BaMgF4
[AD-A146805] N85-16650
CRYSTAL LATTICES
Superlattice ultrasonic wave generator
[AD-D011363] N85-16585
Defective nature of the crystalline lattice of nickel ferrite-based solid solutions
[BLL-WH-595-(9091.9F)] N85-16645
CRYSTAL STRUCTURE
Snow characterization measurements from SNOW-TWO/Smoke Week 6
[AD-A147423] N85-16402
Clusters of defects in semiconductors
[AD-A147426] N85-16655
Temperature dependence of the crystal structures of Nylon 11
[AD-A147563] N85-16661
CRYSTALLIZATION
Method of preparing single crystalline cubic silicon carbide layers
[AD-D011305] N85-16653
Temperature dependence of the crystal structures of Nylon 11
[AD-A147563] N85-16661
CUBA
Evaluation of the climatic resources of Cuba applied to agricultural work N85-16380
CULTURE TECHNIQUES
Problems associated with the utilization of algae in bioregenerative life support systems
[NASA-CR-166615] N85-16469
Algal culture studies related to a Closed Ecological Life Support System (CELSS)
[NASA-CR-177322] N85-16470
CURING
Rubber-modified epoxies. 1: Cure, transitions, and morphology
[AD-A147377] N85-15908
CURVE FITTING
Response surface designs
[AD-A147202] N85-16569
CUTTERS
Evaluation of the Kerie Cable thermal arc cutting equipment
[AD-A147813] N85-16186
CUTTING
Evaluation of the Kerie Cable thermal arc cutting equipment
[AD-A147813] N85-16186
CYCLES
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
View of future requirements for engine cyclic durability by analysis and testing N85-15751
CYCLIC ACCELERATORS
A low perturbation electron injector for cyclic accelerators
[AD-D011312] N85-16604
CYCLIC COMPOUNDS
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride
[AD-D011393] N85-15818
CYCLIC LOADS
A study of the stress wave factor technique for the characterization of composite materials
[NASA-CR-174219] N85-15821
Design procedures for fiber composite structural components: Panels subjected to combined in-plane loads
[NASA-TM-86909] N85-15823
CYCLOTRON RESONANCE DEVICES
Quasi-optical harmonic gyrotron and gyroklystron
[AD-D011308] N85-16001
CYLINDRICAL BODIES
Allowing for the temperature field in the wall thickness of checkerwork in thermal calculation
[BLL-M-96015-(5828.4)] N85-16058
Stability of rigid motions and rollers in bicomponent flows of immiscible liquids
[AD-A147302] N85-16081
CZOCHRALSKI METHOD
Crystal growth and characterization of BaMgF4
[AD-A146805] N85-16650
Clusters of defects in semiconductors
[AD-A147426] N85-16655

D

DAMAGE
The F-15 flight loads tracking program N85-15666
Cumulative damage modeling of fatigue crack growth N85-15741
DATA ACQUISITION
Operational Loads Data
[AGARD-CP-375] N85-15664
Operational loads measurement: A philosophy and its implementation N85-15665
Navy operational loads data sources and systems N85-15668
Advanced fatigue monitoring on service aircraft N85-15671
Helicopter data acquisition in WHL N85-15676
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program
[AD-A146771] N85-15951
National Bureau of Standards passive solar test facility: Instrumentation and site handbook
[PB85-100451/GAR] N85-16148
Rule-based evidence accrual system for image understanding
[AD-A147835] N85-16634
DATA BASE MANAGEMENT SYSTEMS
Future database machine architectures
[AD-A146786] N85-16481
The effects of software quality control and baseline management on the acquisition of computer programs
[AD-A147051] N85-16502
Model-model mappings and conversion in a family of data model specifications
[PB84-217124] N85-16518
Data base support for SIO (System Integration Office)
[AD-A147487] N85-16692
A simulator for determining the performance of transaction manager and lock manager combinations in a database
[AD-A147827] N85-16696
DATA BASES
Commerce Laboratory: Mission analysis payload integration study
[NASA-CR-171298] N85-15764
Climatological information and water resources N85-16367
Water and climate, study of one case N85-16369
The potential contributions of the World Climate Program (WCP) to the economies of developing countries N85-16371
An algorithm for assembly of stiffness matrices into a compacted data structure
[AD-A146727] N85-16492
Model-model mappings and conversion in a family of data model specifications
[PB84-217124] N85-16518
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16687
NBS (National Bureau of Standards) daylight availability database
[PB84-245745] N85-16688
Distributed knowledge base systems for diagnosis and information retrieval
[AD-A146890] N85-16690
Efficient computation of optimal time for transaction processing in a database system
[AD-A147568] N85-16693
DATA CONVERSION ROUTINES
Data handling for the Spectral Radiometer (SPERAD)
[FOA-C-30368-E1,E4] N85-16145
DATA INTEGRATION
An integrated remote sensing approach for identifying ecological range sites — parker mountain
[E85-10050] N85-16246
DATA LINKS
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators
[NAS-MD-790] N85-15705
NOAA (National Oceanic and Atmospheric Administration) Aircraft Satellite Data Link (ASDL)
[PB84-243773] N85-15976
DATA MANAGEMENT
Climate and climate data. Report on the workshop held in Brasilia (Argentina) from 11-15 April 1983 N85-16357
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487
DATA PROCESSING
Adaptive preprocessing system
[AD-D011327] N85-15935
Literature review of voice recognition and generation technology for Army helicopter applications
[AD-A146878] N85-15954
Efficient computation of optimal time for transaction processing in a database system
[AD-A147568] N85-16693
Correlator and data processing requirements for QUASAT N85-16709
DATA RECORDING
Operational loads measurement: A philosophy and its implementation N85-15665
The F-15 flight loads tracking program N85-15666
Flight parameters recording for structure fatigue life monitoring N85-15682
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
DATA REDUCTION
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program
[AD-A146771] N85-15951
Results of the 1984 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-174270] N85-16294
Human factors characteristics of the Joint Tactical Fusion Test Bed: Field test 457 results
[AD-A146856] N85-16476
Processing system for space VLBI N85-16711
DATA SAMPLING
Adaptive preprocessing system
[AD-D011327] N85-15935

DATA STORAGE
Multichannel electrooptical modulators for digital information storage and processing systems N85-16021
Data handling for the Spectral Radiometer (SPERAD) [FOA-C-30368-E1,E4] N85-16145
DATA STRUCTURES
An algorithm for assembly of stiffness matrices into a compacted data structure [AD-A146727] N85-16492
DATA SYSTEMS
A microprocessor data system for developing countries — climatology N85-16377
DATA TRANSMISSION
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators [NAS-MD-790] N85-15705
DEATH
Fatal hemorrhagic shock and acetate solutions [AD-A146754] N85-16444
DECELERATION
Nondestructive deceleration of a rocket sled — target penetration tests [FOA-C-20549-D3] N85-15771
DECIDUOUS TREES
Changes in spectral properties of detached leaves [E85-10042] N85-16243
DECISION MAKING
Performance evaluation of A-10 aircraft maintenance units and aircraft using constrained facet analysis [AD-A146955] N85-15660
Broadening the debate N85-15785
Distribution and storage of aviation turbine fuel for military operations in northern Australia [AD-A147180] N85-15921
Ambiguity and uncertainty in probabilistic inference [AD-A147378] N85-16572
Development of a mixed scanning interactive system for decision support [AD-A146895] N85-16670
On the complexity of distributed decision problems [AD-A147174] N85-16674
Principles of multiobjective optimization [AD-A147520] N85-16679
DECISION THEORY
Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] N85-16474
Principles of multiobjective optimization [AD-A147520] N85-16679
DECOMPOSITION
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys [BLL-M-36028-(5828.4)] N85-15855
DEFECTS
A review of imperfection sensitivity of stiffened shells [AD-A147311] N85-16213
Ultrasonic measurements, X-ray photographs and image processing [BLL-RISLEY-TR-4586-(9091.9F)] N85-16583
DEFLECTORS
Precision electrooptical deflector based on corrugated light guide N85-16020
DEFORESTATION
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica [E85-10051] N85-16247
The water balance and climate — Amazon region N85-16370
The Amazon and climate N85-16376
DEFORMATION
Special features of the deformation of molybdenum at high temperatures [BLL-M-36027-(5828.4)] N85-15856
Stereo Electro-optical Tracking System (SETS) [NASA-CR-172471] N85-16098
DEGREES OF FREEDOM
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 8 to 1.5 [NASA-TP-2365] N85-15778
DEHYDRATION
Effects of restricted water intake on performance in a cold environment [AD-A146904] N85-16450
DEHYDROGENATION
Biochemical evaluation of bodily influence of high and low temperatures N85-16441
DEICERS
Salt action on concrete [AD-A147812] N85-15912
DEICING
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT) [NASA-TM-86919] N85-15757
DELAY CIRCUITS
Programmable synchronous digital delay line [AD-D011382] N85-15985
DELAY LINES
Analog to digital converter [AD-D011338] N85-15983
Programmable synchronous digital delay line [AD-D011382] N85-15985
DEMODULATORS
Digital signal demodulators with single-sideband N85-16019
DENDRITIC CRYSTALS
The growth of metastable peritectic compounds [NASA-CR-171289] N85-15824
DENSITY DISTRIBUTION
The Malin effect in stellar photography N85-16131
DEPLOYMENT
Deployment of a regional array in Norway [AD-A147032] N85-16330
DEPOSITION
The adsorption of CO and oxygen on Cu layers on a W(110) surface [AD-A147345] N85-15847
Evaluation of jet fuel deposit kinetics. Lot 4 [AD-A147196] N85-15922
DEPOSITS
Evaluation of jet fuel deposit kinetics. Lot 4 [AD-A147196] N85-15922
DESCENT
Effects of aircraft and flight parameters on energy-efficient profile descents in time-based metered traffic [NASA-CR-172336-ADD] N85-15706
DESIGN ANALYSIS
Natural environmental criteria for the space station definition and preliminary design, revised [NASA-TM-86460] N85-15773
Computational analysis of scramjet dual mode operation [NASA-CR-174250] N85-16080
Development of large wind energy power generation system [NASA-TM-77779] N85-16301
Development of a preprototype times wastewater recovery subsystem, addendum [NASA-CR-171823] N85-16468
DESIGN TO COST
Evaluation of the measured energy performance of four solar systems [AD-A147912] N85-16308
DESORPTION
The adsorption of CO and oxygen on Cu layers on a W(110) surface [AD-A147345] N85-15847
DESTRUCTIVE TESTS
Comparison of the sensitivities of ultrasonic, radiographic and acoustic emission test methods for the examination of a thick weld [BLL-RISLEY-TR-4547-(9091.9F)] N85-16194
Nondestructive tests and fracture mechanics investigations in the Component Integrity Research Programme [BLL-RISLEY-TR-4541-(9091.9F)] N85-16199
Quantitative acoustic emission techniques [AERE-R-11262] N85-16203
DETECTION
Electronics research at the University of Texas at Austin [AD-A146900] N85-15998
A biological sensor for the detection of toxicants [AD-D011304] N85-16141
Battery control and fault detection method [AD-D011384] N85-16307
Electro-optical target detection [AD-D011366] N85-16617
DETECTORS
The development and test of ultra-large-format multi-anode microchannel array detector systems [NASA-CR-174247] N85-16622
DETERIORATION
Microspots on spectroscopic plates — astronomical photography N85-16113
DETONATION WAVES
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment [AD-A147006] N85-16210
DEUTERIUM
The abundance of deuterium in the outer solar system from ground-based measurements of monodeuterated methane N85-16725
DEVELOPING NATIONS
The potential contributions of the World Climate Program (WCP) to the economies of developing countries N85-16371
A microprocessor data system for developing countries — climatology N85-16377
DIAGNOSIS
A general theory of circuit analogy in fracture diagnosis [AD-A147177] N85-16212
Distributed knowledge base systems for diagnosis and information retrieval [AD-A146890] N85-16690
DIELECTRIC PROPERTIES
Pulse transmission through frozen silt [AD-A147108] N85-15958
A quasi-optical method for measuring the complex permittivity of materials [AD-A147483] N85-15966
DIELECTRICS
Low-loss flexible dielectric waveguide for millimeter-wave transmission and its application to devices [AD-A147848] N85-16006
Method of producing a buried long period grating [AD-D011351] N85-16153
DIENES
Structural and synthetic organosilicon chemistry [AD-A147101] N85-15620
DIESEL ENGINES
Transformation toughened ceramics for the heavy duty diesel engine technology program [NASA-CR-174689] N85-16698
Methods for heat transfer and temperature field analysis of the insulated diesel [NASA-CR-174783] N85-16699
DIFFERENCE EQUATIONS
On a random difference equation for matrices and a characterization of the gamma distribution [AD-A146858] N85-16529
DIFFERENTIAL EQUATIONS
Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods [NASA-TM-86923] N85-15726
An asymptotic analysis of a transient p-n junction model [AD-A147270] N85-16004
Art of programming programmable microcalculators. Part 12: Solution of differential equations N85-16043
Dynamical characteristics of weak turbulence [AD-A147188] N85-16075
DIFFRACTION
Unstable optical resonator with cancelling edge waves [AD-D011379] N85-16618
Switchable zero order diffraction gratings as light valves [AD-A147575] N85-16633
DIFFRACTION PATTERNS
A short note on the high precision navigation of QUASAT N85-16722
DIFFUSION
The structure of dilute combusting sprays [NASA-CR-174838] N85-15728
Diffusion in metals under high mechanical strain and acceleration [JUEL-1913] N85-15887
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
Estimation for a semimartingale regression model using the method of sieves [AD-A146809] N85-16527
DIFFUSION COEFFICIENT
Diffusion in metals under high mechanical strain and acceleration [JUEL-1913] N85-15887
DIFFUSION WELDING
Residual stresses at small diffusion welds [DE84-014982] N85-16159
DIGITAL COMPUTERS
Investigation of semiautomatic aircraft control processes employing time redundancy in on-board digital trajectory control computers N85-16048
Reliability analysis of local area networks, intermediate report [BLL-WH-610-(9091.9F)] N85-16520
DIGITAL DATA
Characterizing the scientific potential of satellite sensors — San Francisco, California [E85-10044] N85-16244
Detecting agricultural to urban land use change from multi-temporal MSS digital data — Salt Lake County, Utah [E85-10049] N85-16245

Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Analysis of subpixel registration N85-16267

DIGITAL FILTERS
Enhancement of multispectral scanner images by digital filtering
[ESA-TT-624] N85-16284

DIGITAL SYSTEMS
Systems study for an Integrated Digital-Electric Aircraft (IDEA)
[NASA-CR-3840] N85-15714
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729
Programmable synchronous digital delay line
[AD-D011362] N85-15985
Digital signal demodulators with single-sideband N85-16019
Digital thermometer with linearizer on slide wire N85-16049
ILIR task of digital recoil travel measurement system
[AD-A147102] N85-16140
Metric aspects of digital images and digital image processing
[AD-A147211] N85-16276
Upset susceptibility study employing circuit analysis and digital simulation — digital systems and electromagnetic interference N85-16344
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345

DIGITAL TECHNIQUES
Detecting agricultural to urban land use change from multi-temporal MSS digital data — Salt Lake County, Utah
[E85-10049] N85-16245

DIMENSIONAL MEASUREMENT
Method for non contacting gauging of the wall thickness of tubes by backscattering radiation
[OEFZS-4274] N85-16144

DIODES
External cavity diode laser sensor
[AD-D011341] N85-16152
Diffusion barrier for long wavelength laser diodes
[AD-D011390] N85-16157

DIPOLE ANTENNAS
Infrared technology for satellite power conversion — antenna arrays and bolometers
[NASA-CR-174266] N85-16293

DIRECTIONAL ANTENNAS
Dual band, low sidelobe, high efficiency mirror antenna
[AD-D011329] N85-15980

DIRT
Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings
[NASA-CR-174274] N85-16296

DISASTERS
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356
Climate and fisheries: A Peruvian case study N85-16373
The El Nino phenomenon and its agrometeorological implications N85-16382

DISCHARGERS
Extended performance technology study 30-cm thruster
[NASA-CR-168259] N85-15806

DISCONTINUITY
MMIC devices for active phased array antennas
[NASA-CR-174281] N85-15843
Deep structure of Western Siberia N85-16235
Surface reconstruction preserving discontinuities
[AD-A146741] N85-16526

DISCRETE FUNCTIONS
Some scientific subroutines in LISP
[AD-A147889] N85-16515

DISEASES
Evaluation of the musculoskeletal diseases program
[PB84-230648] N85-16461

DISINTEGRATION
Inquiry into disintegration control of irradiated low enrichment uranium for high temperature gas cooled reactors
[OEFZS-7281] N85-16615

DISPLACEMENT
Bearing tester fit analysis
[NASA-CR-171282] N85-16181
Experimental compliance calibration of the NASA Lewis Research Center Mode 2 fatigue specimen
[NASA-TM-86906] N85-16205
Use of coordinate functions to calculate deformation fields
[BLL-M-S6010-(5828.4)] N85-16524

DISPLAY DEVICES
Display Techniques for Advanced Crew Stations (DTACS). Phase 1: Display techniques study
[AD-A146922] N85-15722
Interactive Signal Analysis Software (ISAS). User's manual
[AD-A146999] N85-16485
Program visualization: Graphics support for software development
[AD-A146887] N85-16499
Matrix display simulation
[AD-D011371] N85-16695

DISSOCIATION
Ionic reactions of atmospheric importance
[AD-A147354] N85-16333

DISTANCE MEASURING EQUIPMENT
Water masers and distance measurements: The impact of QUASAT N85-16721

DISTORTION
Temperature distortion generator for turboshaft engine testing
[NASA-TM-83748] N85-15658
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86896] N85-15725
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines
[AD-A147092] N85-16073
New aspects of thermoelastic contact
[AD-A147554] N85-16217

DISTRIBUTED PROCESSING
Logic elements for systems with variable structure N85-16054
Support for distributed transactions in the TABS (Transaction based systems) prototype
[AD-A147213] N85-16486
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487

DISTRIBUTION
Decentralized control of scheduling in distributed systems
[AD-A147445] N85-16523

DISTRIBUTION FUNCTIONS
Limiting distributions of functionals of Markov chains
[AD-A147832] N85-16577
Electron distribution function and mobility in 3-5 compounds for high and low fields
[AD-A147447] N85-16658
Transport properties and distribution functions in 3-5 semiconductors
[AD-A147525] N85-16660

DISTRICT OF COLUMBIA
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265

DIURNAL VARIATIONS
Diurnal freeze-thaw frequencies in selected regions of the high latitudes
[AD-A147276] N85-16400
Interrelationship of atmospheric parameters in Honduras
[AD-A147371] N85-16401

DIVING (UNDERWATER)
Evaluation of the Kerie Cable thermal arc cutting equipment
[AD-A147813] N85-16186
Vityaz specialists study human adaptability to ocean depths N85-16225

DOCUMENTS
Document interchange format
[PB84-217033] N85-16517
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16694

DOMES (GEOLOGY)
New data on presence of ores in salt dome structures of Dnieper-Donets Basin N85-16234

DOWN-CONVERTERS
Optical RF downconverter
[AD-D011336] N85-16616

DOWNWASH
Downwash in the plane of symmetry of an elliptically loaded wing
[NASA-TP-2414] N85-15693

DRAG
UH-60A external stores support system fixed provision fairings drag determination
[AD-A147188] N85-15719

DRAG REDUCTION
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716

DRIFT (INSTRUMENTATION)
First tests on the astrometric performance of the new PDS1010G at Hamburg Observatory — granite microdensitometer N85-16135

DRIFT RATE
Transport properties and distribution functions in 3-5 semiconductors
[AD-A147525] N85-16660

DROP TESTS
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095

DROPS (LIQUIDS)
Experimental study of the spray characteristics of a research airblast atomizer
[NASA-TM-86911] N85-15727
The structure of dilute combusting sprays
[NASA-CR-174838] N85-15728

DUCTED ROCKET ENGINES
Integral boost, heat protection, port covers and transition N85-15813

DURABILITY
F-16 force management, yesterday, today and tomorrow N85-15674
Design and test requirements for development of today's engines N85-15737
Overview of the AGARD SMP activities on turbine engine materials technology in the 1972 - 1982 period N85-15738
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C
[NASA-CR-174837] N85-15895

DUST
Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings
[NASA-CR-174274] N85-16296

DYNAMIC CHARACTERISTICS
Power of deterministic thinking in machine tool accuracy
[DE85-001751] N85-16188
Ice dynamics
[AD-A147376] N85-16278

DYNAMIC CONTROL
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing
[NASA-TM-85674] N85-15695
Power of deterministic thinking in machine tool accuracy
[DE85-001751] N85-16188

DYNAMIC LOADS
Evaluation of operational loads to verify structural design N85-15677
TUTOR (CL-41A) tail flight load survey N85-15678
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Flight parameters recording for structure fatigue life monitoring N85-15682
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
Bearing tester fit analysis
[NASA-CR-171282] N85-16181

DYNAMIC MODELS
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel
[NASA-TM-86912] N85-15688
Dynamical characteristics of weak turbulence
[AD-A147186] N85-16075

DYNAMIC RESPONSE
Flutter control with unsteady aerodynamic models
[AD-A147858] N85-15753
The investigation of tethered satellite system dynamics
[NASA-CR-171278] N85-15772

DYNAMIC STABILITY
Index cycles simulated by a low order forced barotropic model N85-16364

DYNAMIC STRUCTURAL ANALYSIS
Aeroelastic analysis and the identification of flight loads — Mirage 2000 aircraft N85-15679

E

EARTH (PLANET)
Research of inverse methods to describe the structure of the earth and ocean bottom
[AD-A147082] N85-16541

EARTH ALBEDO
The effects of long-periodic forcing in a zero-dimensional climate model N85-16363

EARTH ATMOSPHERE
Fluctuations during observations of extraterrestrial sources from outer space through Earth's atmosphere N85-16040
Research in geodesy based upon radio interferometric observations of extragalactic radio sources [AD-A147581] N85-16260
Remote sensing of atmospheric gases with CO2 lasers. Continuation and conclusion of spectroscopic investigations [BMFT-FB-W-84-030] N85-16265
EARTH CRUST
Deep structure of Western Siberia N85-16235
Model of earthquake mechanism N85-16236
Statistical filtering as method for detecting transcrustal acoustic anomalies N85-16237
The mineralogy of global magnetic anomalies [E85-10061] N85-16272
Analysis of gases in the Earth's crust [PB85-113397/GAR] N85-16287
EARTH MANTLE
The mineralogy of global magnetic anomalies [E85-10061] N85-16272
EARTH OBSERVATIONS (FROM SPACE)
Upper Atmosphere Research Satellite (UARS) trade analysis [NASA-CR-175269] N85-15774
EARTH ORBITS
Broadening the debate N85-15785
EARTH PLANETARY STRUCTURE
Khibiny experiment described N85-16230
EARTH ROTATION
Research in geodesy based upon radio interferometric observations of extragalactic radio sources [AD-A147581] N85-16260
EARTHQUAKES
General model of earthquakes and the place of warnings in it N85-16232
Earthquake forecasting research in the Ukraine N85-16233
Model of earthquake mechanism N85-16236
Research activities of the Norwegian seismic array (NORSAR) [AD-A146778] N85-16326
Seismicity of southern Sweden [FOA-C-20543-T1] N85-16340
EAST GERMANY
Limited surface observations climatic summary (LISOCS). Hohenfels, AAF, West Germany [AD-A147167] N85-16393
ECOLOGY
An integrated remote sensing approach for identifying ecological range sites — parker mountain [E85-10050] N85-16246
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica [E85-10051] N85-16247
Ecological impacts of hydroelectric projects in Amazonia N85-16374
ECONOMIC ANALYSIS
cost and benefits optimization model for fault-tolerant aircraft electronic systems [NASA-CR-166043] N85-15993
Development of design and economic parameters for passive solar systems [AD-A147181] N85-16303
Life cycle cost management master plan for the Defense Communications Agency [AD-A146876] N85-16568
ECONOMIC FACTORS
Socio-economic impact of climate — Mexico N85-16372
The El Nino phenomenon and its agrometeorological implications N85-16382
ECONOMICS
Review of climate problems in Latin America and the Caribbean N85-16354
Oceanographic data for development of the US exclusive economic zone [PB85-106458/GAR] N85-16415
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system [AD-A147121] N85-16573
ECOSYSTEMS
Ecological impacts of hydroelectric projects in Amazonia N85-16374
EDDY CURRENTS
A narrow band pulsed eddy current instrument for materials testing [AERE-R-11229] N85-16149
EDGES
A study of interply layer effects on the free-edge stress field of angleplied laminates [NASA-TM-86924] N85-15822
EDUCATION
Requirements for training in climate-related subjects N85-16378
Education and training for the climate related activities in Latin America and the Caribbean N85-16379
Human factors and training research in military organizations and systems [AD-A146832] N85-16475
Ada training curriculum. Real-time systems in Ada 1401 teacher's guide, volume 1 [AD-A146782] N85-16496
Ada training curriculum. Real-time systems in Ada 1401 teacher's guide, volume 2 [AD-A146783] N85-16497
EFFICIENCY
Comparison measurements on optical particle counters [BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
EIGENVALUES
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations [AD-A147463] N85-16554
EJECTION SEATS
Windblast leg protector assembly [AD-D011376] N85-15700
Powered articulated headrest system [AD-D011353] N85-15710
EL NINO
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
Climate and fisheries: A Peruvian case study N85-16373
The El Nino phenomenon and its agrometeorological implications N85-16382
ELASTIC BARS
On the asymptotic analysis of travelling shocks and phase boundaries in elastic bars [AD-A147239] N85-16076
ELASTIC DEFORMATION
Fundamental tribological properties of ceramics [NASA-TM-86915] N85-15893
ELASTIC PROPERTIES
Theoretical and experimental study of hydro-elastic instability on the line of shafting of a rotating machine [BLL-DOUNREAY-TR-937-(9091.9F)] N85-16174
Nonlinear waves in a rod. Results for incompressible elastic materials [AD-A147485] N85-16216
ELASTIC SCATTERING
Fundamentals of microcrack nucleation mechanics [NASA-CR-3851] N85-16195
ELASTIC WAVES
Fundamentals of microcrack nucleation mechanics [NASA-CR-3851] N85-16195
Quantitative acoustic emission techniques [AERE-R-11262] N85-16203
ELECTRIC ARCS
The anode mechanism of a thermal argon arc [NASA-TM-77754] N85-15835
The discharge mechanism of the high-temperature arc [NASA-TM-77794] N85-15837
Arc erosion of metal in current interval of 1-10 amperes N85-16042
Evaluation of the Kerle Cable thermal arc cutting equipment [AD-A147813] N85-16186
ELECTRIC BATTERIES
Composite batteries N85-15832
Safety evaluation of an electronic totalizer containing a Li/(CF)x cell [AD-A147306] N85-16305
Battery control and fault detection method [AD-D011384] N85-16307
ELECTRIC CHARGE
Performance characteristics of a battery charger and state-of-charge indicator [NASA-CR-174273] N85-15992
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
ELECTRIC COILS
Superconducting rotor dynamics [AD-A147176] N85-16000
ELECTRIC CONTACTS
Electromechanical switch [AD-D011400] N85-16009
Arc erosion of metal in current interval of 1-10 amperes N85-16042
ELECTRIC CURRENT
Arc erosion of metal in current interval of 1-10 amperes N85-16042
Region 1 birkeland currents from a global MHD simulation of the magnetosphere [AD-A147435] N85-16335
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
ELECTRIC FIELDS
High voltage effects measured on dummy mannequin N85-16432
Research relative to plasma transport across the magnetopause [NASA-CR-174300] N85-16636
Electron distribution function and mobility in 3-5 compounds for high and low fields [AD-A147447] N85-16658
Transport properties and distribution functions in 3-5 semiconductors [AD-A147525] N85-16660
ELECTRIC FILTERS
EMI (electromagnetic interference) filter capacitor unit [AD-D011392] N85-15941
Analog to digital converter [AD-D011338] N85-15983
The design of high order active RC-filters [DRIC-T-7147] N85-15987
ELECTRIC GENERATORS
Superconducting rotor dynamics [AD-A147176] N85-16000
ELECTRIC MOTOR VEHICLES
Performance characteristics of a battery charger and state-of-charge indicator [NASA-CR-174273] N85-15992
ELECTRIC NETWORKS
Diagnosis of insulation defects in 1000+ V distribution networks with insulated neutral N85-16044
ELECTRIC POTENTIAL
The anode mechanism of a thermal argon arc [NASA-TM-77754] N85-15835
Studies on copper alloys containing chromium on the copper side phase diagram [NASA-TM-77752] N85-15876
Transmission line biased coherent array of Josephson oscillators [AD-D011323] N85-15979
Analog to digital converter [AD-D011338] N85-15983
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16048
Battery control and fault detection method [AD-D011384] N85-16307
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345
The ac power line protection for an IEEE 587 Class B environment N85-16347
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
ELECTRIC POWER PLANTS
Progress in developing tidal electric power plants reported N85-16314
Geothermal wells drilled in Transcarpathians N85-16315
ELECTRIC PROPULSION
Extended performance technology study 30-cm thruster [NASA-CR-168259] N85-15806
ELECTRIC SWITCHES
Electromechanical switch [AD-D011400] N85-16009
ELECTRIC WIRE
Hardwire missile receiver coupler [AD-D011350] N85-15936
ELECTRICAL ENGINEERING
Target detection using microwave irradiances from natural sources: A passive, local and global surveillance system [NASA-CR-174260] N85-15991
Basic research in electronic (JSEP): Joint Services Electronics Program [AD-A147691] N85-16007
USSR report: Electronics and electrical engineering [JPRS-UEE-84-018] N85-16014
USSR report: Electronics and electrical engineering [JPRS-UEE-84-017] N85-16025
ELECTRICAL INSULATION
Diagnosis of insulation defects in 1000+ V distribution networks with insulated neutral N85-16044
ELECTRICAL MEASUREMENT
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory [AD-A147161] N85-15844
A narrow band pulsed eddy current instrument for materials testing [AERE-R-11229] N85-16149

ELECTRICAL PROPERTIES
Optical properties of composite materials
[AD-A146788] N85-15828
ELECTRICAL RESISTIVITY
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902
The relationship between radiation sensitivity and redox equilibria — glass processing variables
[AD-A147216] N85-15906
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914
The constant current strain gauge bridge
[ARL-STRUC-TM-385] N85-16097
ELECTRO-OPTICS
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-018] N85-16014
Precision electrooptical deflector based on corrugated light guide N85-16020
Multichannel electrooptical modulators for digital information storage and processing systems N85-16021
Stereo Electro-optical Tracking System (SETS)
[NASA-CR-172471] N85-16096
Measurement of high temperature strain by the laser-speckle strain gauge
[NASA-TM-77751] N85-16207
Electro-optical target detection
[AD-D011386] N85-16617
The development and test of ultra-large-format multi-anode microchannel array detector systems
[NASA-CR-174247] N85-16622
Optics and opto-electronic systems
[AD-A147277] N85-16630
Crystal growth and characterization of BaMgF4
[AD-A146805] N85-16650
ELECTROACOUSTIC TRANSDUCERS
Acoustic transducers for fast reactor instrumentation
[BLL-RISLEY-TR-4979-(9091.9F)] N85-16091
Lightweight, broadband Rayleigh wave transducer
[AD-D011345] N85-16584
ELECTROCHEMICAL CELLS
High capacity inorganic oxyhalide electrochemical cell
[AD-D011321] N85-15845
ELECTROCHEMISTRY
High capacity inorganic oxyhalide electrochemical cell
[AD-D011321] N85-15845
ELECTRODES
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15995
Microwave resonator using lateral excitation
[AD-D011374] N85-16596
ELECTRODYNAMICS
The investigation of tethered satellite system dynamics
[NASA-CR-171278] N85-15772
ELECTROENCEPHALOGRAPHY
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
ELECTROFORMING
Study of high performance alloy electroforming
[NASA-CR-174276] N85-15875
ELECTROLUMINESCENCE
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15995
Research on electroluminescence in thin film yttrium oxysulfide
[AD-A146909] N85-16582
ELECTROLYSIS
Study of the liquid vapor equilibrium in the bromine-hydrobromic acid-water system
[NASA-TM-77787] N85-15836
Engineering model system study for a regenerative fuel cell: Study report
[NASA-CR-174801] N85-16292
ELECTROLYTIC CELLS
High capacity inorganic oxyhalide electrochemical cell
[AD-D011321] N85-15845
Engineering model system study for a regenerative fuel cell: Study report
[NASA-CR-174801] N85-16292
ELECTROMAGNETIC ABSORPTION
Optical properties of composite materials
[AD-A146788] N85-15828
Study of optical sound generation and amplification
[AD-A147359] N85-16592
ELECTROMAGNETIC FIELDS
Khibiny experiment described N85-16230
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
A comparison of lightning and nuclear electromagnetic pulse response of tactical shelters N85-16350
Forces on neutral atoms due to electromagnetic fields
[AD-A146984] N85-16603
ELECTROMAGNETIC INTERFERENCE
Natural interference phenomena affecting spaceborne receivers
[NASA-CR-174256] N85-15796
EMI (electromagnetic interference) filter capacitor unit
[AD-D011392] N85-15941
Upset susceptibility study employing circuit analysis and digital simulation — digital systems and electromagnetic interference N85-16344
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345
ELECTROMAGNETIC MEASUREMENT
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix
[AD-A146848] N85-15953
Khibiny experiment described N85-16230
ELECTROMAGNETIC NOISE
Estimation of requirements for acceptable noise radiation level of communication transmitters N85-16017
NBS (National Bureau of Standards) switching radiometers
[PB84-235894] N85-16147
ELECTROMAGNETIC PULSES
Multiple scattering effects on transmission through the atmosphere
[AD-A147527] N85-15969
Real-time analysis of space characteristics of microwave electromagnetic pulse fields by means of controllable layer structures N85-16052
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
A comparison of lightning and nuclear electromagnetic pulse response of tactical shelters N85-16350
ELECTROMAGNETIC RADIATION
Method for forming electromagnetic-wave-screening composite N85-15930
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix
[AD-A146848] N85-15953
Transformation of electromagnetic waves in plasma with randomly-heterogeneous magnetic field N85-16039
Tolerance synthesis of multilayer radome walls N85-16041
ELECTROMAGNETIC SCATTERING
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643
ELECTROMAGNETIC SHIELDING
A comparison of lightning and nuclear electromagnetic pulse response of tactical shelters N85-16350
ELECTROMAGNETIC WAVE FILTERS
Method for forming electromagnetic-wave-screening composite N85-15930
ELECTROMAGNETISM
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix
[AD-A146848] N85-15953
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-017] N85-16025
ELECTROMECHANICAL DEVICES
Systems study for an Integrated Digital-Electric Aircraft (IDEA)
[NASA-CR-3840] N85-15714
Electromechanical switch
[AD-D011400] N85-16009
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
ELECTROMOTIVE FORCES
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
ELECTRON BEAM WELDING
Welding of PM-superalloys
[MTU-TB-910/84] N85-16191
ELECTRON BEAMS
FORTRAN version of the quantitative energy-dispersive electron beam X-ray analysis program FRAME C
[PB84-240936] N85-16519
A low perturbation electron injector for cyclic accelerators
[AD-D011312] N85-16604
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174266] N85-16639
ELECTRON BUNCHING
Calculated parameters for the initial part of an accelerator with high-frequency quadrupole focusing
[RAE-TRANS-2122] N85-16600
ELECTRON DENSITY (CONCENTRATION)
Gas pressure and electron density in the active zone level of hollow cathode arc discharges
[NASA-TM-77468] N85-15988
ELECTRON DISTRIBUTION
Electron distribution function and mobility in 3-5 compounds for high and low fields
[AD-A147447] N85-16658
ELECTRON MICROSCOPY
Comments on the image contrast from inelastically scattered electrons
[DE85-000899] N85-16609
ELECTRON ORBITALS
The 13C nuclear magnetic resonance in graphite intercalation compounds
[NASA-CR-174261] N85-16601
ELECTRON PRECIPITATION
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726
ELECTRON SCATTERING
Comments on the image contrast from inelastically scattered electrons
[DE85-000899] N85-16609
ELECTRON SPECTROSCOPY
Electron spectrometry experiments with the use of synchrotron radiation
[DE85-001286] N85-16610
ELECTRON STATES
Application of quantum chemistry of atmospheric chemistry
[AD-A147035] N85-15843
ELECTRON TRANSITIONS
Infrared emission and atomic transitions
[AD-A147840] N85-16607
ELECTRON-ION RECOMBINATION
Ionic reactions of atmospheric importance
[AD-A147354] N85-16333
ELECTRONIC COUNTERMEASURES
Rivista Tecnica Selenia, volume 9, number 1 N85-15945
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949
ELECTRONIC EQUIPMENT
Target detection using microwave irradiances from natural sources: A passive, local and global surveillance system
[NASA-CR-174260] N85-15991
cost and benefits optimization model for fault-tolerant aircraft electronic systems
[NASA-CR-166043] N85-15993
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-017] N85-16025
The electronic typesetting program programmer's manual
[AD-A147500] N85-16508
ELECTRONIC EQUIPMENT TESTS
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949
ELECTRONIC MODULES
Electronic module insertion and retraction mechanism
[AD-D011309] N85-16002
ELECTRONS
Application of the diffraction model to amorphous magnesium zinc alloys
[AD-A147369] N85-15883
ELECTROPHOTOMETERS
The Torun measuring system for astronomical spectra N85-16130
ELECTROPHYSICS
Basic research in electronic (JSEP): Joint Services Electronics Program
[AD-A147891] N85-16007
ELECTROPHYSIOLOGY
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
ELECTROSTATIC ENGINES
Ion thruster project
[NASA-TM-77726] N85-15805
ELECTROSTATIC PROBES
Ionic reactions of atmospheric importance
[AD-A147354] N85-16333
ELECTROSTATICS
Data appendix: F-number=1.0 EMR with a flexible back electrode
[NASA-CR-172477] N85-15994
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174266] N85-16639

ELECTROTHERMAL ENGINES
Qualification of an electrothermal hydrazine thruster with a vacuum thrust of 0.5 to 2.0 N
[BMFT-FB-W-84-043] N85-15808
ELLIPTIC FUNCTIONS
Some scientific subroutines in LISP
[AD-A147889] N85-16515
Feedback, adaptivity and A-posterior estimates in finite elements: Aims, theory and experience
[AD-A146869] N85-16531
ELLIPTICITY
Downwash in the plane of symmetry of an elliptically loaded wing
[NASA-TP-2414] N85-15693
EMBEDDING
Immobilization of toxic waste by embedding it in bitumen
[OEFZS-4277] N85-16322
Extracting embedded generalized networks from linear programming problems
[AD-A147565] N85-16558
EMBOLISMS
Pathogenesis and treatment of cerebral air embolism and associated disorders
[AD-A146723] N85-16443
EMERGENCIES
Liposome-encapsulated hemoglobin for emergency resuscitation
[AD-A146794] N85-16446
EMISSION
SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas
[AD-A147528] N85-16641
EMISSION SPECTRA
The compact radio emission regions in active galactic nuclei --- QUASAT VLBI mission N85-16713
EMITTERS
Power transfer from natural emitters to collection apertures at microwave wavelengths
[NASA-CR-174275] N85-15989
Research on electroluminescence in thin film yttrium oxysulfide
[AD-A146909] N85-16582
ENERGY CONSERVATION
Hangar heating and energy conservation manual
[AD-A147893] N85-15762
Development of design and economic parameters for passive solar systems
[AD-A147181] N85-16303
Evaluation of the measured energy performance of four solar systems
[AD-A147912] N85-16306
Oil-shale exploration expansion urged N85-16317
ENERGY CONSUMPTION
Hangar heating and energy conservation manual
[AD-A147893] N85-15762
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
Development of design and economic parameters for passive solar systems
[AD-A147181] N85-16303
Oil-shale exploration expansion urged N85-16317
ENERGY CONVERSION
Performance and cost of energy transport and storage systems for dish applications using reversible chemical reactions
[NASA-CR-174263] N85-16298
ENERGY CONVERSION EFFICIENCY
Liquid-fueled Ramjet engines N85-15814
Multijunction cells for concentrators: Technology prospects
[NASA-CR-174259] N85-16295
Progress in developing tidal electric power plants reported N85-16314
ENERGY POLICY
Design criteria for small wind turbines
[NLR-MP-83054-U] N85-16310
Verification of the fatigue properties of (small) wind turbines
[NLR-MP-83055-U] N85-16311
Energy and climate: Problems in Latin America N85-16375
ENERGY REQUIREMENTS
Energy and climate: Problems in Latin America N85-16375
ENERGY STORAGE
Engineering model system study for a regenerative fuel cell: Study report
[NASA-CR-174801] N85-16292
Performance and cost of energy transport and storage systems for dish applications using reversible chemical reactions
[NASA-CR-174263] N85-16298
ENERGY TRANSFER
Power transfer from natural emitters to collection apertures at microwave wavelengths
[NASA-CR-174275] N85-15989
ENGINE AIRFRAME INTEGRATION
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729
ENGINE CONTROL
Study on control of ion engine system
[EL-847] N85-15800
ENGINE DESIGN
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
ENGINE INLETS
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86896] N85-15725
Ramjet air induction system design for tactical missile application N85-15811
ENGINE PARTS
Overview of the AGARD SMP activities on turbine engine materials technology in the 1972 - 1982 period N85-15738
Cumulative damage modeling of fatigue crack growth N85-15741
Problems and possibilities for life extension in gas turbine components N85-15742
Disc fatigue life predictions for gas turbine engines N85-15743
Life prediction at high temperature under multiaxial loading N85-15745
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
ENGINE TESTS
Temperature distortion generator for turboshaft engine testing
[NASA-TM-83748] N85-15658
Engine Cyclic Durability by Analysis and Testing
[AGARD-CP-368] N85-15733
Accelerated Mission Endurance Testing (AMET) N85-15736
Design and test requirements for development of today's engines N85-15737
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
Qualification of an electrothermal hydrazine thruster with a vacuum thrust of 0.5 to 2.0 N
[BMFT-FB-W-84-043] N85-15808
Integrated exhaust gas analysis system for aircraft turbine engine component testing
[NASA-TP-2424] N85-16100
ENGINES
A simulation model for Air Launched Cruise Missile engine management
[AD-A147018] N85-16672
ENVIRONMENT EFFECTS
Ecological impacts of hydroelectric projects in Amazonia N85-16374
The Amazon and climate N85-16376
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry
[DE85-001272] N85-16406
ENVIRONMENTAL SURVEYS
Helicopter noise survey performed at Las Vegas, Nevada, 19-21 January, 1984
[AD-A147392] N85-16593
ENVIRONMENTAL TESTS
Effects of restricted water intake on performance in a cold environment
[AD-A146904] N85-16450
EPIDEMIOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
EPOXY COMPOUNDS
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909
EPOXY MATRIX COMPOSITES
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
Ultrasonic analysis of spherical composite test specimens
[DE85-001591] N85-16197
EPOXY RESINS
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
Rubber-modified epoxies. 1: Cure, transitions, and morphology
[AD-A147377] N85-15908
All-composite Airbus empennage N85-15931
EQUATIONS OF MOTION
More than you want to know about maximum likelihood estimation
[NASA-TM-85905] N85-15752
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072
EQUATIONS OF STATE
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
EQUILIBRIUM EQUATIONS
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium
[AD-A147868] N85-15915
EQUILIBRIUM FLOW
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium
[AD-A147868] N85-15915
ERGODIC PROCESS
Omni transforms: Applications to renewal theory
[AD-A146939] N85-16534
Conditionally heteroscedastic autoregressions
[AD-A147168] N85-16567
A non-commutative quasi subadditive ergodic theorem
[AD-A146810] N85-16581
ERGOMETERS
Comparison between cycle ergometers with different mechanical braking systems
[FOA-C-54058-H1] N85-16193
EROSION
Arc erosion of metal in current interval of 1-10 amperes N85-16042
ERROR ANALYSIS
NBS (National Bureau of Standards) and WR62 and WR90 reference noise standards
[PB84-235704] N85-15977
Errors of analog of inertial coordinate systems modeled in astronavigation system N85-16028
NBS (National Bureau of Standards) switching radiometers
[PB84-235894] N85-16147
Modeling of human motion by computer considering measurement errors in initial data N85-16429
A complete characterization of triply balanced matrices with applications to survey sampling
[AD-A147083] N85-16542
Bayesian estimation of undetected errors
[AD-A147198] N85-16545
ERRORS
A discussion of coning errors exhibited by inertial navigation systems
[AD-A147846] N85-15708
Array sidelobes, error tolerance, gain, and beamwidth
[AD-A147004] N85-15956
ESTERS
Fluorinated diacrylic esters
[AD-D011328] N85-15689
ESTIMATES
Geostatistics for resource and reserve estimation
[PB85-105761/GAR] N85-16286
Forest area estimates from LANDSAT MSS and forest inventory plot data
[PB85-105617/GAR] N85-16290
Estimation for a semimartingale regression model using the method of sieves
[AD-A146809] N85-16527
ESTIMATING
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
Bayesian estimation of undetected errors
[AD-A147198] N85-16545
ETHYL ALCOHOL
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
EULER EQUATIONS OF MOTION
A comparative study of the nonuniqueness problem of the potential equation
[NASA-TP-2385] N85-15894
EUROPEAN AIRBUS
All-composite Airbus empennage N85-15931
EUROPEAN SPACE AGENCY
International involvement in a civilian space station program N85-15760
EUTECTIC ALLOYS
Reciprocal solubility of phases in multi-component systems
[BLL-M-36003-(5828.4)] N85-15870
Alloys and method of making
[AD-D011337] N85-15874
EUTECTICS
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824

Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15880

EVALUATION
Performance evaluation of A-10 aircraft mainteance units and aircraft using constrained facet analysis
[AD-A146955] N85-15660
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS)
[NASA-TP-2425] N85-16351
A survey and evaluation of software quality assurance
[AD-A147552] N85-16510

EVAPORATION
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment
[AD-A147006] N85-16210

EVOKED RESPONSE (PSYCHOPHYSIOLOGY)
Central regulation of sensory flow in human visual system N85-16435
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
Nicholet MED-80 (trademark) programs in the Naval Biodynamics Laboratory evoked potential series
[AD-A147105] N85-16451

EVOLUTION (DEVELOPMENT)
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422

EXCIMER LASERS
Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens
[AD-D011311] N85-16163

EXCITATION
Intense excitation source of blue-green laser
[AD-A147450] N85-16168
Theoretical study of laser-induced surface excitations on a grating
[AD-A147855] N85-16172
Microwave resonator using lateral excitation
[AD-D011374] N85-16596
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606

EXERCISE PHYSIOLOGY
A machine for weight-lift testing
[AD-A146816] N85-16182
Effects of restricted water intake on performance in a cold environment
[AD-A146904] N85-16450

EXHAUST EMISSION
Facility safety study
[NASA-CR-174280] N85-15759

EXHAUST GASES
Integrated exhaust gas analysis system for aircraft turbine engine component testing
[NASA-TP-2424] N85-16100
NOx emissions near a heat pump with gas motor
[BLL-WH-782-(9091.9F)] N85-16319

EXHAUST NOZZLES
Carbon/carbon rocket motor exit cone reinforcement
[AD-D011360] N85-15799

EXPERIMENT DESIGN
Response surface designs
[AD-A147202] N85-16569

EXPERT SYSTEMS
Mental models and cooperative problem solving with expert systems
[AD-A147643] N85-16479

EXPLOSIONS
Numerical reconstruction of part of an actual blast-wave flow field to agree with available experimental data
[UTIAS-TN-251] N85-16061
Nonlinear wave propogation study
[AD-A147011] N85-16329

EXPLOSIVES
Making high explosive bodies for shaped charges by casting or pressing. Shaped charge research at Research Institute of National Defence (FOA) in 1972 - 1983, part 1
[FOA-C-20554-D4-PT-1] N85-15923

EXPOSURE
Using a Gossen light meter to produce enlarged interpositive film copies from glass plates — astronomical photography N85-16118
Carotid baroreceptor influences on peripheral circulatory and thermal responses during cold exposure
[AD-A146808] N85-16447
A crew exposure study. Volume 1: Offshore
[AD-A146884] N85-16449

EXTERNAL STORES
UH-60A external stores support system fixed provision fairings drag determination
[AD-A147188] N85-15719

EXTRACTION
Extracting embedded generalized networks from linear programming problems
[AD-A147565] N85-16558

EXTRAGALACTIC RADIO SOURCES
Research in geodesy based upon radio interferometric observations of extragalactic radio sources
[AD-A147581] N85-16280

EXTRATERRESTRIAL RADIATION
Fluctuations during observations of extraterrestrial sources from outer space through Earth's atmosphere N85-16040
Cosmology N85-16701

EXTREMELY HIGH FREQUENCIES
Potential affiliate stations to work with the EVN — European VLBI Network; QUASAT N85-16706

EXTREMELY LOW FREQUENCIES
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174286] N85-16639

EYE (ANATOMY)
Eyes for computers N85-16428

EYE MOVEMENTS
Neuro-linguistic programming: Eye movements as indicators of representational systems
[AD-A147541] N85-16454

F

F-8 AIRCRAFT
F-8 refueling boom ground vibration test
[NASA-TM-84914] N85-15713

F-15 AIRCRAFT
The F-15 flight loads tracking program N85-15666
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729

F-16 AIRCRAFT
F-16 force management, yesterday, today and tomorrow N85-15674

FABRICATION
Development of short gate FET's
[AD-A147033] N85-15999
Control technology for integrated circuit fabrication at Micro-Circuit Engineering, Incorporated, West Palm Beach, Florida
[PB85-100717/GAR] N85-16013
Infrared technology for satellite power conversion — antenna arrays and bolometers
[NASA-CR-174266] N85-16293
Switchable zero order diffraction gratings as light valves
[AD-A147575] N85-16633

FABRICS
Flame-resistant materials for use in pyrotechnic safety clothing
[AD-A146857] N85-15901

FACTOR ANALYSIS
A factor analysis for time series
[AD-A147495] N85-16574

FACTORIAL DESIGN
Model robust response surface designs: Scaling 2-level factorials
[AD-A147494] N85-16556

FACTORIZATION
Supersonic nonlinear potential analysis
[NASA-CR-172456] N85-15685

FAILURE ANALYSIS
Investigation of the HPFTP first stage impeller crack
[NASA-CR-171281] N85-16208

FAIRINGS
UH-60A external stores support system fixed provision fairings drag determination
[AD-A147188] N85-15719

FALLOUT
Assessment of radiation dosages obtained by intake of radioactive fallout contaminated food
[VTT-292] N85-16460

FAR FIELDS
Efficient computation of reflector antenna aperture distributions and far field patterns
[AD-A147367] N85-15962

FAR INFRARED RADIATION
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643

FARADAY EFFECT
Influence of Faraday effect in ionosphere on nonmutuality of meteor radio channel N85-16037

FARM CROPS
Spatial estimation from remotely sensed data via empirical Bayes models N85-16256
The climate in food production in Latin America N85-16359
The challenge of food production: The importance of climate N85-16361
The management of atmospheric resources in food production N85-16362

FASTENERS
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints — aircraft structures
[LBF-FB-172/84] N85-16219

FATIGUE (BIOLOGY)
Human factors survey: C-5 pilots
[AD-A147106] N85-16477

FATIGUE (MATERIALS)
Operational Loads Data
[AGARD-CP-375] N85-15664
Operational loads measurement: A philosophy and its implementation N85-15665
The F-15 flight loads tracking program N85-15666
Structural load measurements on a Northrop NF-5A N85-15667
Operational loads data evaluation for individual aircraft fatigue monitoring N85-15669
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
Monitoring engine thermal stresses N85-15735
Mechanical aspects of high temperature coatings N85-15749
Study of residual stresses introduced into TA6ZrD (685) cylinders by quenching
[BLL-PNR-90240-(8019.3153)] N85-15859
Experimental compliance calibration of the NASA Lewis Research Center Mode 2 fatigue specimen
[NASA-TM-86908] N85-16205
Verification of the fatigue properties of (small) wind turbines
[NLR-MP-83055-U] N85-16311

FATIGUE LIFE
Operational loads measurement: A philosophy and its implementation N85-15665
The F-15 flight loads tracking program N85-15666
Navy operational loads data sources and systems N85-15668
Structural flight load measurement demonstration of structural integrity N85-15670
Advanced fatigue monitoring on service aircraft N85-15671
Flight parameters recording for structure fatigue life monitoring N85-15682
Disc fatigue life predictions for gas turbine engines N85-15743
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
Thermal-mechanical fatigue crack growth in Inconel X-750
[NASA-CR-174740] N85-15877
Fatigue strength of different sintered steels and design criteria for porous material (PM) parts
[LBF-FB-170/84] N85-15886
Fundamentals of microcrack nucleation mechanics
[NASA-CR-3851] N85-16195
Possibilities for a more accurate life prediction of components — gas turbine disks N85-16198
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints — aircraft structures
[LBF-FB-172/84] N85-16219

FATIGUE TESTS
Advanced fatigue monitoring on service aircraft N85-15671
Design and test requirements for development of today's engines N85-15737
Inconel 718 alloy resistance to crack propagation N85-15740
Engine cyclic durability by analysis and material testing N85-15744
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099

FATTY ACIDS
The lipid composition and its alteration during the growth stage in pathogenic fungus, epidermophyton floccosum
[NASA-TM-77440] N85-16421

FAULT TOLERANCE
cost and benefits optimization model for fault-tolerant aircraft electronic systems
[NASA-CR-166043] N85-15993
Local area network evaluation by MICROSS extensions
[AD-A145773] N85-16521

FAULTS
Battery control and fault detection method
[AD-D011384] N85-16307

FEASIBILITY ANALYSIS
Results of principal NASA studies on space station uses and functional requirements N85-15787
Feasibility of producing a range of food products from a limited range of undifferenitiated major food components
[NASA-CR-177329] N85-16473
NSW (National Software Works) lessons learned
[AD-A146737] N85-16494
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models
[AD-A147329] N85-16676

FEATHERING
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715

FEDERAL BUDGETS
Financing considerations and Federal budget impacts N85-15792

FEEDBACK
Feedback, adaptivity and A-posterior estimates in finite elements: Aims, theory and experience
[AD-A146869] N85-16531
Unstable optical resonator with cancelling edge waves
[AD-D011379] N85-16618

FEEDBACK CONTROL
Flutter control with unsteady aerodynamic models
[AD-A147858] N85-15753
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178

FERRITES
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Defective nature of the crystalline lattice of nickel ferrite-based solid solutions
[BLL-WH-595-(9091.9F)] N85-16645

FIBER COMPOSITES
Design procedures for fiber composite structural components: Panels subjected to combined in-plane loads
[NASA-TM-86909] N85-15823
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties
[AD-A147504] N85-15829
Composite batteries N85-15932

FIBER OPTICS
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851
The relationship between radiation sensitivity and redox equilibria — glass processing variables
[AD-A147216] N85-15906
Holographic directional coupler for fiber optic systems
[AD-D011365] N85-15939
Micro-waveguide transformers of coherent optical signals N85-16022
Helmet mounted telescope
[AD-D011355] N85-16467
Multiwavelength bidirectional coupler-decouplers
[AD-A147009] N85-16625
Optical fibers with reduced pressure sensitivity to high frequency acoustic field
[AD-D011306] N85-16627
Bragg cell spectrum analyzer specification
[AD-D011320] N85-16629
Analytic models for radiation induced loss in optical fibers 2: A physical model
[AD-A147442] N85-16632
Research and technology, 1984 report
[NASA-TM-83096] N85-16730

FIBER REINFORCED COMPOSITES
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754
Unidirectional fibers and polyurethane elastomer matrix based composites synthesis and properties
[NASA-TM-77501] N85-15826
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties
[AD-A147504] N85-15829
Verification of the fatigue properties of (small) wind turbines
[NLR-MP-83055-U] N85-16311

FIBER STRENGTH
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851

FIBERS
Flame resistant fibrous materials development
[NASA-CR-167817] N85-15827

FIELD EFFECT TRANSISTORS
Dual-gate MESFET variable gain constant output power amplifier
[AD-D011334] N85-15982
Development of short gate FET's
[AD-A147033] N85-15999
Linear wideband microwave amplifiers for monolithic integrated microcircuits N85-16051

FIELD OF VIEW
Helmet mounted telescope
[AD-D011355] N85-16467

FIGHTER AIRCRAFT
Operational Loads Data
[AGARD-CP-375] N85-15664
Structural load measurements on a Northrop NF-5A N85-15667
Navy operational loads data sources and systems N85-15668
Structural flight load measurement demonstration of structural integrity N85-15670
Display Techniques for Advanced Crew Stations (DTACS). Phase 1: Display techniques study
[AD-A146922] N85-15722
Can the Aggressors continue to be effective in the F-5E?
[AD-A146861] N85-16485

FILM BOILING
Instability of film boiling of moving liquids
[BLL-WH-603-(9091.9F)] N85-16056

FILM CONDENSATION
Heat transfer due to film condensation on vertical fluted tubes
[AD-A147258] N85-16079

FINANCIAL MANAGEMENT
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16687

FINITE DIFFERENCE THEORY
An exploratory study of finite difference grids for transonic unsteady aerodynamics
[NASA-TM-84583] N85-15696
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078
Laminar flow over a backward-facing step
[AD-A147469] N85-16084
Finite difference calculations of buoyant convection in an enclosure. Part 2: Verification of the nonlinear algorithm
[PB85-104065/GAR] N85-16089

FINITE ELEMENT METHOD
CFM 56-2. Oligocyclic fatigue of the turbofan disk: Dimensionning and tests for verification and improvements N85-15750
A study of interply layer effects on the free-edge stress field of angleplied laminates
[NASA-TM-86924] N85-15822
Finite element procedures applicable to nonlinear analysis of reinforced concrete shell structures
[AD-A146796] N85-16209
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
Feedback, adaptivity and A-posterior estimates in finite elements: Aims, theory and experience
[AD-A146869] N85-16531
Solution of finite element problems by preconditioned conjugate gradient and Lanczos methods
[AD-A146921] N85-16532
Performance of the h, p and h-p versions of the finite element method
[AD-A146940] N85-16535
A counterexample to a result of Strang and Fix concerning controlled approximation
[AD-A147360] N85-16550
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147463] N85-16554

FIRE CONTROL
Voice command weapons launching system
[AD-D011378] N85-15940

FIRE EXTINGUISHERS
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701

FIREPROOFING
Flame-resistant materials for use in pyrotechnic safety clothing
[AD-A146857] N85-15801

FISHERIES
Climate and fisheries: A Peruvian case study N85-16373
The use of hydrometeorological data in explaining shrimp cycles in Guyana N85-16381

FISHES
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422

FLAME HOLDERS
Computational analysis of scramjet dual mode operation
[NASA-CR-174250] N85-16060

FLAME RETARDANTS
Flame resistant fibrous materials development
[NASA-CR-167817] N85-15827

FLAMES
The structure of dilute combusting sprays
[NASA-CR-174838] N85-15728

FLANGES
High temperature ultra-high vacuum infrared window seal
[AD-D011333] N85-15890

FLAT PLATES
A second-order accurate parabolized Navier-Stokes algorithm for internal flows
[NASA-CR-174258] N85-16059
Free surface effects on the wake of a flat plate
[AD-A146988] N85-16071

FLEXIBILITY
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints — aircraft structures
[LBF-FB-172/84] N85-16219

FLEXIBLE BODIES
Low-loss flexible dielectric waveguide for millimeter-wave transmission and its application to devices
[AD-A147848] N85-16006
Flexible line support assembly
[AD-D011391] N85-16177
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178

FLIGHT CHARACTERISTICS
Effects of aircraft and flight parameters on energy-efficient profile descents in time-based metered traffic
[NASA-CR-172338-ADD] N85-15706

FLIGHT CONTROL
Aircraft thrust control scheme for terrain following system
[AD-D011387] N85-15711
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 8 to 1.5
[NASA-TP-2365] N85-15778
Literature review of voice recognition and generation technology for Army helicopter applications
[AD-A146878] N85-15954
cost and benefits optimization model for fault-tolerant aircraft electronic systems
[NASA-CR-166043] N85-15993

FLIGHT CREWS
Establishment of posture and working movements of pilot in air crash enquiries N85-16417
Human factors survey: C-5 pilots
[AD-A147106] N85-16477
An analysis of constraints to coordinated tactical crew interaction in the P-3C aircraft
[AD-A147220] N85-16478

FLIGHT INSTRUMENTS
Commerce Laboratory: Mission analysis payload integration study
[NASA-CR-171298] N85-15764

FLIGHT LOAD RECORDERS
Operational Loads Data
[AGARD-CP-375] N85-15664
Operational loads measurement: A philosophy and its implementation N85-15665
The F-15 flight loads tracking program N85-15666
Operational loads data evaluation for individual aircraft fatigue monitoring N85-15669
US Army helicopter operational flight loads N85-15675
Flight parameters recording for structure fatigue life monitoring N85-15682

USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
FLIGHT PATHS
Effects of aircraft and flight parameters on energy-efficient profile descents in time-based metered traffic
[NASA-CR-172338-ADD] N85-15706
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729
Investigation of semiautomatic aircraft control processes employing time redundancy in on-board digital trajectory control computers N85-16048
FLIGHT SIMULATION
NyKINM, a further development of KINM 22 — simulation of a robot attack on an aircraft
[FOA-C-20559-D6(E3)] N85-15720
Practice makes perfect
[AD-A147124] N85-16466
FLIGHT TESTS
Structural flight load measurement demonstration of structural integrity N85-15670
CF-5 vertical stabilizer flight load survey N85-15673
Ground-effect analysis of a jet transport airplane
[NASA-TM-85920] N85-15687
The UH-1H helicopter icing flight test program: An overview
[NASA-TM-86925] N85-15702
Flight testing of Litton laser gyro strapdown system LTN-90 for general aviation
[DFVLR-MITT-84-16] N85-15709
Noise measurement flight test: Data-analyses aerospatiale AS-355F TwinStar helicopter
[AD-A147497] N85-16595
FLIGHT TRAINING
Can the Aggressors continue to be effective in the F-5E?
[AD-A146861] N85-16465
Practice makes perfect
[AD-A147124] N85-16466
FLOATING
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
FLORIDA
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396
FLOTATION
Investigations into the improvement of processing of Bolivian tin ores
[BMFT-FB-T-84-184] N85-15807
FLOW CHARACTERISTICS
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel
[NASA-TM-86912] N85-15688
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701
FLOW DISTRIBUTION
Supersonic nonlinear potential analysis
[NASA-CR-172456] N85-15685
An exploratory study of finite difference grids for transonic unsteady aerodynamics
[NASA-TM-84583] N85-15696
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
Columbia: The first 5 flights entry heating data series. Volume 1: An overview
[NASA-CR-171820] N85-15777
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15801
High altitude chemically reacting gas particle mixtures. Volume 2: Program manual for RAMP2 — rocket nozzle and orbital plume flow fields
[NASA-CR-171827] N85-15802
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual — rocket nozzle and orbital plume flow fields
[NASA-CR-171828] N85-15803
Computational analysis of scramjet dual mode operation
[NASA-CR-174250] N85-16060
Numerical reconstruction of part of an actual blast-wave flow field to agree with available experimental data
[UTIAS-TN-251] N85-16061
Numerical studies of interacting vortices
[NASA-TM-86325] N85-16062
Aero-optics experimental techniques
[AD-A146755] N85-16067
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines
[AD-A147092] N85-16073
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078
FLOW GEOMETRY
An improved computer model for prediction of axial gas turbine performance losses
[NASA-CR-174246] N85-15724
FLOW MEASUREMENT
Turbulence measurement interferometer apparatus
[AD-D011377] N85-16156
Investigation of the ice dynamics in the marginal ice zone
[AD-A146729] N85-16411
FLOW STABILITY
Stability of rigid motions and rollers in bicomponent flows of immiscible liquids
[AD-A147302] N85-16081
FLOW VISUALIZATION
Unsteady flow characteristics in the near-wake of a two-dimensional obstacle
[NASA-TM-77762] N85-15684
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade
[NASA-TM-86914] N85-15689
FLUID BOUNDARIES
Instability of film boiling of moving liquids
[BLL-WH-603-(9091.9F)] N85-16056
FLUID DYNAMICS
A method for solving the inverse problem of transonic cascade flow
[AD-A146739] N85-15696
Dynamical characteristics of weak turbulence
[AD-A147186] N85-16075
Solution of partial differential equations on vector and parallel computers
[NASA-CR-172500] N85-16525
FLUID FLOW
Stability of rigid motions and rollers in bicomponent flows of immiscible liquids
[AD-A147302] N85-16081
Numerical solutions for steady natural convection in a square cavity
[PB84-245752] N85-16090
FLUIDIZED BED PROCESSORS
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300
FLUORESCENCE
Solar energy conversion based on the principle of fluorescent collectors. Installation of a test collector to deliver several Watts power
[BMFT-FB-T-84-192] N85-16308
Solar energy conversion based on the principle of fluorescent collectors
[BMFT-FB-T-84-193] N85-16309
FLUORINE
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283
FLUORO COMPOUNDS
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride
[AD-D011393] N85-15818
FLUOROHYDROCARBONS
Fluorinated diacrylic esters
[AD-D011328] N85-15889
FLUOROPOLYMERS
Fluorinated diacrylic esters
[AD-D011328] N85-15889
Dynamic polymer pressure transducer with temperature compensation
[AD-D011373] N85-16142
FLUSHING
Nitrogen flushing during exposure of large Schmidt telescope plates N85-16109
FLUTTER
Flutter control with unsteady aerodynamic models
[AD-A147858] N85-15753
FOCUSING
Calculated parameters for the initial part of an accelerator with high-frequency quadrupole focusing
[RAE-TRANS-2122] N85-16600
FOG
An evaluation of an advection fog prediction model
[AD-A147436] N85-16403
FOOD
Assessment of radiation dosages obtained by intake of radioactive fallout contaminated food
[VTT-292] N85-16460
FOOD PROCESSING
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
Feasibility of producing a range of food products from a limited range of undifferentiated major food components
[NASA-CR-177329] N85-16473
FORCED VIBRATION
The Shock and Vibration Digest, volume 16, no. 9
[AD-A146779] N85-16200
FOREBODIES
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6
[NASA-TM-86345] N85-15657
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
FORECASTING
General model of earthquakes and the place of warnings in it N85-16232
Earthquake forecasting research in the Ukraine N85-16233
Crop yield forecasting N85-16360
A note on using the integrated form of ARIMA forecasts
[AD-A146965] N85-16536
Life cycle cost management master plan for the Defense Communications Agency
[AD-A146876] N85-16668
The Air Force can improve its forecasts of aircraft spare parts requirements
[AD-A147911] N85-16682
FORESTS
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Forest area estimates from LANDSAT MSS and forest inventory plot data
[PB85-105617/GAR] N85-16290
Deciduous forest radiation regimes: Effects of forest structure, phenology and Earth-Sun geometry upon their spatial, temporal and spectral variability
[AD-A146804] N85-16327
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry
[DE85-001272] N85-16406
FORMAT
RATFOR user's guide version 2.0
[NASA-CR-166601] N85-16490
Document interchange format
[PB84-217033] N85-16517
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16694
FORMING TECHNIQUES
Heliostat tested N85-16318
FORTRAN
RATFOR user's guide version 2.0
[NASA-CR-166601] N85-16490
NOISEMAP 4.4 computer program update, operator's manual, addendum 1
[AD-A147091] N85-16503
FORTRAN version of the quantitative energy-dispersive electron beam X-ray analysis program FRAME C
[PB84-240936] N85-16519
FOURIER TRANSFORMATION
Micro-waveguide transformers of coherent optical signals N85-16022
FRACTURE MECHANICS
Engine Cyclic Durability by Analysis and Testing
[AGARD-CP-368] N85-15733
Investigation of the creep behaviour of soft soldered joints with solder L-SnAg5 at ambient temperature
[BLL-T6383/BG/WH798/84] N85-15865
Influence of pressure on compaction during compression of powders of iron and 40Kh and 10R6MS steels
[BLL-M-35995-(5828.4)] N85-15866
Nondestructive tests and fracture mechanics investigations in the Component Integrity Research Programme
[BLL-RISLEY-TR-4541-(9091.9F)] N85-16199
A general theory of circuit analogy in fracture diagnosis
[AD-A147177] N85-16212
A hydrogen partitioning model for hydrogen assisted crack growth
[AD-A147385] N85-16214
New aspects of thermoelastic contact
[AD-A147554] N85-16217
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
FRACTURE STRENGTH
Inconel 718 alloy resistance to crack propagation N85-15740
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916

FRACTURES (MATERIALS)
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
FRAMES
A general theory of circuit analogy in fracture diagnosis
[AD-A147177] N85-16212
FREE ATMOSPHERE
C2 sub n (optical) studies in the free atmosphere based on rawinsonde data
[AD-A147307] N85-16332
FREE ELECTRON LASERS
Rippled-field magnetron apparatus
[AD-D011354] N85-16154
A new free electron laser using a relativistic beam with spiralling electron
[AD-D011318] N85-16165
FREE FALL
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095
FREE FLIGHT
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793
FREE VIBRATION
The Shock and Vibration Digest, volume 16, no. 9
[AD-A146779] N85-16200
FREEZING
Forecasting water temperature decline and freeze-up in rivers
[AD-A147068] N85-16274
Diurnal freeze-thaw frequencies in selected regions of the high latitudes
[AD-A147276] N85-16400
FREQUENCY ASSIGNMENT
Radar frequency selection strategies
[AD-A147493] N85-15967
FREQUENCY CONTROL
Diagnostic apparatus for radar pulse repetition frequency control circuit card
[AD-D011364] N85-15936
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010
FREQUENCY MODULATION
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
FREQUENCY STABILITY
Reference oscillator stability effect on clutter cancellation in a radar system N85-15946
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010
FRESNEL DIFFRACTION
Optimization piezoelectric transducer width of acousto-optical devices N85-16024
The evaluation of a deformable diffraction grating for a stigmatic EUV spectrohelioneter
[NASA-CR-174248] N85-16621
FRICTION
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C
[NASA-CR-174837] N85-15895
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896
FRICTION WELDING
Welding of PM-superalloys
[MTU-TB-910/84] N85-16191
FROST
Salt action on concrete
[AD-A147812] N85-15912
FUEL COMBUSTION
Liquid-fueled Ramjet engines N85-15814
Ramjets with supersonic combustion N85-15817
FUEL INJECTION
Experimental study of the spray characteristics of a research airblast atomizer
[NASA-TM-86911] N85-15727
FUEL OILS
USSR report: Energy
[JPRS-UEN-84-038] N85-16312
FUEL TANKS
Aircraft wing fuel tank environmental simulator tests for evaluation of antimisting fuels
[FAA-CT-84-15] N85-15920
Distribution and storage of aviation turbine fuel for military operations in northern Australia
[AD-A147160] N85-15921
FUELS
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program
[PB85-100931/GAR] N85-15928
FUNCTIONAL DESIGN SPECIFICATIONS
Design study of technology requirements for high performance single-propeller-driven business airplanes
[NASA-CR-3663] N85-15692
FUNCTIONS (MATHEMATICS)
The resistance and mobility functions of two equal spheres in low Reynolds number flow
[AD-A147301] N85-16080
Estimation for a semimartingale regression model using the method of sieves
[AD-A146809] N85-16527
Conjunctive and disjunctive item response functions
[AD-A147815] N85-16561
FUNGI
The lipid composition and its alteration during the growth stage in pathogenic fungus, epidermophyton floccosum
[NASA-TM-77440] N85-16421
FURNACES
Procedure for investigating high-temperature properties of iron-ore materials
[BLL-M-36020-(5828.4)] N85-15868
Heliostat tested N85-16316

G

GALACTIC CLUSTERS
Cosmology N85-16701
GALACTIC NUCLEI
Some aspects of active galactic nuclei N85-16702
The environment of active galactic nuclei N85-16712
The compact radio emission regions in active galactic nuclei — QUASAT VLBI mission N85-16713
Very Long Base Interferometry (VLBI) in space and X-ray observations of compact sources in active galactic nuclei N85-16716
GALACTIC STRUCTURE
Some aspects of active galactic nuclei N85-16702
The galactic gamma-ray distribution: Implications for galactic structure and the radial cosmic ray gradient
[NASA-TM-86173] N85-16729
GALLIUM ARSENIDES
Gallium arsenide compounds tested nondestructively with X-rays N85-15934
Development of short gate FET's
[AD-A147033] N85-15999
X-ray and backscattering analysis of ion implantation phenomena in GaAs and related compounds
[AD-A147449] N85-16659
Aluminum nitride insulator for 3-5 MIS (Metal-Insulator-Semiconductor) applications
[AD-A147842] N85-16662
GAMMA FUNCTION
On a random difference equation for matrices and a characterization of the gamma distribution
[AD-A146858] N85-16529
GAMMA RAYS
The galactic gamma-ray distribution: Implications for galactic structure and the radial cosmic ray gradient
[NASA-TM-86173] N85-16729
GAS ANALYSIS
Integrated exhaust gas analysis system for aircraft turbine engine component testing
[NASA-TP-2424] N85-16100
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287
GAS BEARINGS
Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C
[NASA-CR-174837] N85-15895
GAS CHROMATOGRAPHY
Description and operation of a thermal decomposition unit-gas chromatographic system
[PB84-246362] N85-16146
GAS COMPOSITION
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287
GAS COOLING
Gas cooled fuel cell systems technology development
[NASA-CR-174732] N85-16291
GAS DETECTORS
Gas contamination detection device
[AD-D011366] N85-15833
GAS PRESSURE
Gas pressure and electron density in the active zone level of hollow cathode arc discharges
[NASA-TM-77468] N85-15988
Improvement of gas-tightness of OTTG and TBO-5 threaded pipe couplings
[BLL-M-36993-(5828.4)] N85-16175
GAS TURBINE ENGINES
Mounting construction for turbine vane assembly
[AD-D011395] N85-15723
Control system design language implementation of a gas turbine starting controller
[AD-A147886] N85-15732
Overview of the AGARD SMP activities on turbine engine materials technology in the 1972 - 1982 period N85-15738
Comparison between the properties of conventional wrought and powder metallurgical alloys for turbine disc applications N85-15739
Cumulative damage modeling of fatigue crack growth N85-15741
Disc fatigue life predictions for gas turbine engines N85-15743
Engine cyclic durability by analysis and material testing N85-15744
Life prediction at high temperature under multiaxial loading N85-15745
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
Verification of life prediction through component testing N85-15748
View of future requirements for engine cyclic durability by analysis and testing N85-15751
Current problems in turbomachinery fluid dynamics
[AD-A147127] N85-16074
Integrated exhaust gas analysis system for aircraft turbine engine component testing
[NASA-TP-2424] N85-16100
GAS TURBINES
An improved computer model for prediction of axial gas turbine performance losses
[NASA-CR-174246] N85-15724
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
Accelerated Mission Endurance Testing (AMET) N85-15736
Mechanical aspects of high temperature coatings N85-15749
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines
[AD-A147092] N85-16073
Possibilities for a more accurate life prediction of components — gas turbine disks N85-16198
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300
Combustion chamber floatwall panel attachment arrangement
[AD-D011358] N85-16647
GAS-SOLID INTERACTIONS
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15801
Influence of size grading of sintering ore on the sintering process
[BLL-M-36004-(5828.4)] N85-15854
GASES
Apparatus for determining the liquid water content of a gas
[AD-D011297] N85-15839
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15846
Identification of leaks: Internal acoustic method, phase 2
[PB85-101947/GAR] N85-15927
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program
[PB85-100931/GAR] N85-15928
Convection heat transfer in the critical region of fluid mixtures
[DE85-002118] N85-16088
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
GASOLINE
Some characteristics of automotive gasolines and their performance in a light aircraft engine
[FAA-CT-84-12] N85-15919
Cooling system investigation of the 3-kW MEP models 016A, 021A, and 028A (60Hz, 400-Hz and 28-V dc) gasoline-engine-driven generator sets
[AD-A147571] N85-16185
GATES (CIRCUITS)
Development of short gate FET's
[AD-A147033] N85-15999
Development of a 2 micrometer silicon-gate-CMOS-technology for microcomputer oriented VLSI circuits with a supply voltage range between 1.5 and 5 V
[BMFT-FB-T-84-203] N85-16012

Two carrier dual injector apparatus
[AD-D011357] N85-16646

GEARS
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099

GENERAL AVIATION AIRCRAFT
Design study of technology requirements for high performance single-propeller-driven business airplanes
[NASA-CR-3863] N85-15692
Some characteristics of automotive gasolines and their performance in a light aircraft engine
[FAA-CT-84-12] N85-15919

GEOCHEMISTRY
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287

GEODESY
An interactive FORTRAN program for determining reliability of pseudo-range geodetic point positioning using the global positioning system
[AD-A147133] N85-16275

GEODYNAMICS
General model of earthquakes and the place of warnings in it N85-16232
Earthquake forecasting research in the Ukraine N85-16233

GEOLOGICAL FAULTS
Synthesis of proterozoic data as a prerequisite for tectonic and thermal modeling
[NASA-CR-174252] N85-16323

GEOLOGICAL SURVEYS
Maritime prospecting, mining discussed N85-16226
Integrated analysis of remote sensing products from basic geological surveys --- Brazil
[E85-10052] N85-16248

GEOLOGY
Exploring ocean's mineral wealth N85-16227

GEOMAGNETIC TAIL
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726

GEOMAGNETISM
Earth's radiation belts
[AD-A147927] N85-16339

GEOMETRIC RECTIFICATION (IMAGERY)
Rectification of single and multiple frames of satellite scanner imagery using points and edges as control N85-16263
The influence of the number of ground control points on the scene-to-map registration accuracy --- Kansas, Louisiana, Mississipp, and Missouri N85-16264

GEOMETRY
Investigation of the creep behaviour of soft soldered joints with solder L-SnAg5 at ambient temperature
[BLL-T6383/BG/WH798/84] N85-15865

GEOPHYSICS
Deployment of a regional array in Norway
[AD-A147032] N85-16330

GEORGIA
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387

GEOTHERMAL ANOMALIES
Interpreting geothermal anomalies by special points method N85-16238

GEOTHERMAL ENERGY CONVERSION
USSR report: Energy
[JPRS-UEN-84-038] N85-16312
Deputy Minister discusses plans for geothermal power N85-16313

GEOTHERMAL ENERGY EXTRACTION
Geothermal wells drilled in Transcarpathians N85-16315

GEOTHERMAL ENERGY UTILIZATION
Deputy Minister discusses plans for geothermal power N85-16313

GEOTHERMAL RESOURCES
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287
Coso Monitoring Program, January 1981 through December 1983
[AD-A147894] N85-16338

GERMANIUM ALLOYS
Optical properties of composite materials
[AD-A146768] N85-15828

GERMANIUM OXIDES
The relationship between radiation sensitivity and redox equilibria --- glass processing variables
[AD-A147216] N85-15906

GERMANY
Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16398

GERT
A Q-GERT network simulation model for examining pipeline time in the Navy's J-52 intermediate level jet engine repair cycle
[AD-A147269] N85-15663

GLASS
Method for bonding insulator to insulator
[AD-D011340] N85-15891
The relationship between radiation sensitivity and redox equilibria --- glass processing variables
[AD-A147216] N85-15906
Cryogenic glass-to-metal seal
[AD-D011370] N85-15911

GLASS FIBER REINFORCED PLASTICS
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754
Stresses in pin-loaded orthotropic plates using photoelasticity
[NASA-CR-172498] N85-16204

GLASS FIBERS
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851
Composite batteries N85-15932

GLASS LASERS
The development of a high average power glass laser source
[AD-A147471] N85-16169

GLOBAL POSITIONING SYSTEM
An interactive FORTRAN program for determining reliability of pseudo-range geodetic point positioning using the global positioning system
[AD-A147133] N85-16275

GLOW DISCHARGES
Silent discharge carbon dioxide gas laser machining facility
[BLL-CTO-2267-(9091.9F)] N85-16150

GOALS
Broadening the debate N85-15785
Toward a goal-oriented civilian space program N85-15786

GOVERNMENT PROCUREMENT
A buyer's guide to space infrastructure N85-15784
Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements N85-15790
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system
[AD-A147121] N85-16673
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681

GOVERNMENT/INDUSTRY RELATIONS
Financing considerations and Federal budget impacts N85-15792

GOVERNMENTS
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684

GRAIN BOUNDARIES
Design of ordered intermetallic alloys for high-temperature structural use
[DE85-000897] N85-15885

GRAINS (FOOD)
Crop yield forecasting N85-16360

GRANITE
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283

GRAPHITE
Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C
[NASA-CR-174837] N85-15895
The 13C nuclear magnetic resonance in graphite intercalation compounds
[NASA-CR-174261] N85-16601

GRAPHITE-EPOXY COMPOSITES
A study of the stress wave factor technique for the characterization of composite materials
[NASA-CR-174219] N85-15821

GRATINGS (SPECTRA)
Method of producing a buried long period grating
[AD-D011351] N85-16153
Theoretical study of laser-induced surface excitations on a grating
[AD-A147855] N85-16172
Switchable zero order diffraction gratings as light valves
[AD-A147575] N85-16633

GRAVITATIONAL EFFECTS
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15880

GRAVITATIONAL LENSES
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715

GRAVITY GRADIOMETERS
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095

GRAVITY WAVES
Dispersion properties of moving ionospheric perturbations N85-16036

GREASES
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184
Corrosion properties of second-generation conductive materials N85-16348

GREENLAND
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390

GRIDS
An exploratory study of finite difference grids for transonic unsteady aerodynamics
[NASA-TM-84583] N85-15696

GROUND EFFECT (AERODYNAMICS)
Ground-effect analysis of a jet transport airplane
[NASA-TM-85920] N85-15687

GROUND RESONANCE
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715

GROUND STATIONS
Potential affiliate stations to work with the EVN --- European VLBI Network; QUASAT N85-16708

GROUND SUPPORT EQUIPMENT
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators
[NAS-MD-790] N85-15705
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949

GROUND TRUTH
Exploring the use of structural models to improve remote sensing agricultural estimates N85-16259
The influence of the number of ground control points on the scene-to-map registration accuracy --- Kansas, Louisiana, Mississipp, and Missouri N85-16264

GROUND WATER
Fate and disposition of trichloroethylene in surface soils
[AD-A147918] N85-16321

GROUND WAVE PROPAGATION
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer
[AD-A147438] N85-15965

GROUND WIND
Atmospheric environment for Space Shuttle (STS-41G) launch
[NASA-TM-86486] N85-16320
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F
[AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F
[AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F
[AD-A146915] N85-16386
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F
[AD-A146918] N85-16389

Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Lousiana, parts A-F
[AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396

GROUP DYNAMICS
An analysis of constraints to coordinated tactical crew interaction in the P-3C aircraft
[AD-A147220] N85-16478

GROUP THEORY
Nonlinear semigroups and evolution governed by accretive operators
[AD-A147556] N85-16557

GUIDANCE SENSORS
Study of alternate optical and fine guidance sensor designs for the space infrared telescope facility (SIRTF)
[NASA-CR-166614] N85-15794

GUIDE VANES
Mounting construction for turbine vane assembly
[AD-D011395] N85-15723

GUYANA
The use of hydrometeorological data in explaining shrimp cycles in Guyana N85-16381

H

HALOCARBONS
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701

HAMILTON-JACOBI EQUATION
Viscosity solutions of Hamilton-Jacobi equations at the boundary
[AD-A147444] N85-16553

HAMILTONIAN FUNCTIONS
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560

HANDBOOKS
National Bureau of Standards passive solar test facility: Instrumentation and site handbook
[PB85-100451/GAR] N85-16148
Project manager's handbook for special projects
[AD-A147913] N85-16683
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16694

HANGARS
Hangar heating and energy conservation manual
[AD-A147893] N85-15762

HARMONIC GENERATORS
Quasi-optical harmonic gyrotron and gyroklystron
[AD-D011306] N85-16001

HARMONIC OSCILLATORS
Reference oscillator stability effect on clutter cancellation in a radar system N85-15946

HEAD (ANATOMY)
Powered articulated headrest system
[AD-D011353] N85-15710

HEAT
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics
[AD-A146851] N85-16423

HEAT BUDGET
Razrezy program research in the tropical Atlantic N85-16229

HEAT EXCHANGERS
Allowing for the temperature field in the wall thickness of checkerwork in thermal calculation
[BLL-M-36015-(5828.4)] N85-16058

HEAT FLUX
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture
[NASA-TM-86898] N85-16096
Self-generated magnetic fields and thermal flux inhibition
[AD-A147405] N85-16166
New aspects of thermoelastic contact
[AD-A147554] N85-16217

HEAT PIPES
Thermally isolated structural support link
[AD-D011349] N85-16176

HEAT PUMPS
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program
[PB85-100931/GAR] N85-15928
NOx emissions near a heat pump with gas motor
[BLL-WH-782-(9091.9F)] N85-16319

HEAT RADIATORS
Methods for heat transfer and temperature field analysis of the insulated diesel
[NASA-CR-174783] N85-16699

HEAT RESISTANT ALLOYS
Method for making alloy additions to base metals having higher melting points
[AD-D011403] N85-15884
Welding of PM-superalloys
[MTU-TB-910/84] N85-16191
The effect of the test atmosphere on the formation and propagation of creep cracks in commercial high temperature alloys
[JUEL-1939] N85-16221

HEAT STROKE
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics
[AD-A146851] N85-16423

HEAT TRANSFER
Engine Cyclic Durability by Analysis and Testing
[AGARD-CP-368] N85-15733
Monitoring engine thermal stresses N85-15735
Heat transfer due to film condensation on vertical fluted tubes
[AD-A147258] N85-16079
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture
[NASA-TM-86898] N85-16096
Razrezy program research in the tropical Atlantic N85-16229
Frazil ice formation
[AD-A147425] N85-16279

HEAT TRANSMISSION
Interpreting geothermal anomalies by special points method N85-16238

HEAT TREATMENT
Problems and possibilities for life extension in gas turbine components N85-15742
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36028-(5828.4)] N85-15855
Procedure for investigating high-temperature properties of iron-ore materials
[BLL-M-36020-(5828.4)] N85-15868
On heat-treatable copper-chromium alloy, 1
[NASA-TM-77753] N85-15879
Method for bonding insulator to insulator
[AD-D011340] N85-15891
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046

HEATING
Analysis of the heating process of a body in a melt
[BLL-M-36014-(5828.4)] N85-16057

HEAVY IONS
The (20)Ne interaction in extended matter
[NASA-TM-86312] N85-16728

HEIGHT
The 500 millibar sign frequency teleconnection charts: Winter
[PB85-106276/GAR] N85-16410

HELICOPTER DESIGN
Speed benefits of tilt-rotor designs for LHX
[NASA-CR-166437] N85-15717

HELICOPTERS
Operational Loads Data
[AGARD-CP-375] N85-15664
Helicopter data acquisition in WHL N85-15676
The UH-1H helicopter icing flight test program: An overview
[NASA-TM-86925] N85-15702
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715
Literature review of voice recognition and generation technology for Army helicopter applications
[AD-A146878] N85-15954
Helicopter noise survey performed at Las Vegas, Nevada, 19-21 January, 1984
[AD-A147392] N85-16593
Noise measurement flight test: Data-analyses aerospatiale AS-355F TwinStar helicopter
[AD-A147497] N85-16595

HELIOSTATS
Heliostat tested N85-16318

HELIUM
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793

HELMET MOUNTED DISPLAYS
Helmet mounted telescope
[AD-D011355] N85-16467

HELMETS
Helmet mounted telescope
[AD-D011355] N85-16467

HEMODYNAMIC RESPONSES
Distribution of blood flow to brain, kidneys, gut, spleen and posterior extremities in cats in acute hypoxia N85-16434

HEMORRHAGES
Fatal hemorrhagic shock and acetate solutions
[AD-A145754] N85-16444

HERMETIC SEALS
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148389] N85-15851
Method for bonding insulator to insulator
[AD-D011340] N85-15891

HETEROGENEITY
Transformation of electromagnetic waves in plasma with randomly-heterogeneous magnetic field N85-16039
Fluctuations during observations of extraterrestrial sources from outer space through Earth's atmosphere N85-16040

HETEROJUNCTION DEVICES
Preparation and evaluation of ZnSe and ZnS sub X Se sub 1-x epitaxial layers on Ge substrates for applications in surface passivation and heterojunction devices
[AD-A147432] N85-16657

HETEROJUNCTIONS
Diffusion barrier for long wavelength laser diodes
[AD-D011390] N85-16157

HIERARCHIES
Evidence accumulation for spatial reasoning N85-16261

HIGH ASPECT RATIO
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing
[NASA-TM-85674] N85-15695
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697

HIGH FREQUENCIES
Optical fibers with reduced pressure sensitivity to high frequency acoustic field
[AD-D011306] N85-16627

HIGH LEVEL LANGUAGES
Software test handbook
[AD-A146844] N85-16498

HIGH POWER LASERS
The development of a high average power glass laser source
[AD-A147471] N85-16169
High-power radiating plasma
[NASA-TM-77784] N85-16637

HIGH PRESSURE
Understanding the high pressure properties of molecular solids and molecular surfaces deposited on hetrogeneous substrates
[NASA-CR-174262] N85-16649

HIGH REYNOLDS NUMBER
Aeroacoustic data for high Reynolds number supersonic axisymmetric jets
[NASA-TM-86296] N85-16587

HIGH STRENGTH
Improvement of gas-tightness of OTTG and TBO-6 threaded pipe couplings
[BLL-M-35993-(5828.4)] N85-16175

HIGH STRENGTH ALLOYS
Study of high performance alloy electroforming
[NASA-CR-174278] N85-15675

HIGH TEMPERATURE
Life prediction at high temperature under multiaxial loading N85-15745
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
Mechanical aspects of high temperature coatings N85-15749
Design of ordered intermetallic alloys for high-temperature structural use
[DE85-000897] N85-15865
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
Transformation toughened ceramics for the heavy duty diesel engine technology program
[NASA-CR-174889] N85-16698

HIGH TEMPERATURE GAS COOLED REACTORS
Inquiry into disintegration control of irradiated low enrichment uranium for high temperature gas cooled reactors
[OEFZS-7281] N85-16615

HIGH TEMPERATURE GASES
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas
[AD-A147481] N85-16170
The environment of active galactic nuclei N85-16712
HIGH TEMPERATURE TESTS
Special features of the deformation of molybdenum at high temperatures
[BLL-M-36027-(5828.4)] N85-15856
HIGH VOLTAGES
Diagnosis of insulation defects in 1000+ V distribution networks with insulated neutral N85-16044
High voltage effects measured on dummy mannequin N85-16432
HILBERT SPACE
Analytic and sequential feynman integrals on abstract Wiener and Hilbert spaces, and A Cameron-Martin formula. Revision
[AD-A146969] N85-16537
HISTORIES
Man in Space: National Historic Landmark Theme Study
[PB85-107233/GAR] N85-15768
HOLES (ELECTRON DEFICIENCIES)
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15995
Two carrier dual injector apparatus
[AD-D011357] N85-16646
HOLLOW CATHODES
Extended performance technology study 30-cm thruster
[NASA-CR-168259] N85-15806
Gas pressure and electron density in the active zone level of hollow cathode arc discharges
[NASA-TM-77468] N85-15988
HOLOGRAPHY
Holographic directional coupler for fiber optic systems
[AD-D011365] N85-15939
Solid state research
[NASA-CR-174285] N85-16656
HONDURAS
Interrelationship of atmospheric parameters in Honduras
[AD-A147371] N85-16401
HORIZONTAL ORIENTATION
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
HOT PRESSING
Development and production of improved alpha-phase silicon nitride powders for hot pressing and sintering
[BMFT-FB-T-84-208] N85-15830
Development and production of improved silicon carbide powder for pressureless sintering and hot pressing
[BMFT-FB-T-84-211] N85-15917
HOT-WIRE ANEMOMETERS
Aero-optics experimental techniques
[AD-A146755] N85-16067
HOUSINGS
Thermally isolated structural support link
[AD-D011340] N85-16176
HUBBLE DIAGRAM
Cosmology N85-16701
HUMAN BEINGS
Modeling of human motion by computer considering measurement errors in initial data N85-16429
HUMAN BODY
Comparison of thermal responses between rest and leg exercise in water
[AD-A146818] N85-16448
Effects of body mass and morphology on thermal responses in water
[AD-A147558] N85-16455
HUMAN FACTORS ENGINEERING
Biodynamic resistant control stick
[AD-D011380] N85-15721
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
Human factors and training research in military organizations and systems
[AD-A146832] N85-16475
Human factors characteristics of the Joint Tactical Fusion Test Bed: Field test 467 results
[AD-A146856] N85-16476
Mental models and cooperative problem solving with expert systems
[AD-A147843] N85-16479
HUMAN PERFORMANCE
Performance evaluation of A-10 aircraft maintenance units and aircraft using constrained facet analysis
[AD-A146955] N85-15660
Nondestructive inspection: Improved capabilities of technicians
[AD-A147388] N85-16196
Effects of restricted water intake on performance in a cold environment
[AD-A145904] N85-16450
On the structure of information in software
[AD-A147580] N85-16511
HUMAN TOLERANCES
Vityaz specialists study human adaptability to ocean depths N85-16225
HYDRAULIC CONTROL
Powered articulated headrest system
[AD-D011353] N85-15710
HYDRAULIC FLUIDS
Toxic hazards research
[AD-A147857] N85-16425
HYDROBROMIC ACID
Study of the liquid vapor equilibrium in the bromine-hydrobromic acid-water system
[NASA-TM-77787] N85-15836
HYDROCARBONS
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287
HYDROELECTRIC POWER STATIONS
Ecological impacts of hydroelectric projects in Amazonia N85-16374
HYDROGEN
The results of hydrogen hypersensitization of photoemulsions — astronomical photography N85-16108
HYDROGEN ATOMS
Reactions of butadiyne. 1: The reaction with hydrogen atoms
[NASA-TM-77805] N85-15834
HYDROGEN EMBRITTLEMENT
A hydrogen partitioning model for hydrogen assisted crack growth
[AD-A147385] N85-16214
HYDROGEN OXYGEN ENGINES
Nonlinear control model of an H2O steam reactor
[DFVLR-FB-84-30] N85-16192
HYDROGEN PRODUCTION
Production of hydrogen by cyanobacteria
[PB85-113421/GAR] N85-15925
HYDROGEN SULFIDE
Thio and seleno compounds of the transition metals with the d (o) configuration
[BLL-MINTEK-TR-1177-(5810.5759)] N85-15863
HYDROGRAPHY
The long term upper ocean study (LOTUS). Cruise summary and hydrographic data report, OCEANUS 154, May 1984
[AD-A147906] N85-16414
HYDROLOGY
USSR report: Earth sciences
[JPRS-UES-84-008] N85-16223
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
Razrezy program research in the tropical Atlantic N85-16229
HYDROMECHANICS
Free surface effects on the wake of a flat plate
[AD-A146988] N85-16071
HYDROMETEOROLOGY
Use of minicomputers for the formation of hydrological data banks N85-16358
Water and climate, study of one case N85-16369
The use of hydrometeorological data in explaining shrimp cycles in Guyana N85-16381
HYPERBOLIC FUNCTIONS
Some scientific subroutines in LISP
[AD-A147889] N85-16515
HYPERFINE STRUCTURE
The evaluation of a deformable diffraction grating for a stigmatic EUV spectroheliometer
[NASA-CR-174248] N85-16621
HYPERSONIC FLOW
Laminar heat-transfer distributions on biconics at incidence in hypersonic-hypervelocity flows
[NASA-TP-2213] N85-16065
HYPERSONIC REENTRY
Columbia: The first 5 flights entry heating data series. Volume 1: An overview
[NASA-CR-171820] N85-15777
HYPERVELOCITY FLOW
Laminar heat-transfer distributions on biconics at incidence in hypersonic-hypervelocity flows
[NASA-TP-2213] N85-16065
HYPOXEMIA
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439
HYPOXIA
Distribution of blood flow to brain, kidneys, gut, spleen and posterior extremities in cats in acute hypoxia N85-16434
Biochemical evaluation of bodily influence of high and low temperatures N85-16441

I

ICE
Salt action on concrete
[AD-A147812] N85-15912
Pulse transmission through frozen silt
[AD-A147108] N85-15958
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
ICE FLOES
Parachute expedition to Arctic N85-16240
ICE FORMATION
The UH-1H helicopter icing flight test program: An overview
[NASA-TM-86925] N85-15702
The NASA Altitude Wind Tunnel (AWT): Its role in advanced icing research and development
[NASA-TM-86920] N85-15758
Frazil ice formation
[AD-A147425] N85-16279
Snow characterization measurements from SNOW-TWO/Smoke Week 6
[AD-A147423] N85-16402
ICE PREVENTION
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT)
[NASA-TM-86919] N85-15757
IGNITION SYSTEMS
Laser ignition of explosives
[FOA-C-20550-D1] N85-16173
ILLINOIS
Revised Uniform Summary of Surface Weather Observations (RUSSWO). O'Hare International Airport, Chicago, parts A-F
[AD-A147206] N85-16399
ILLUMINATION
NBS (National Bureau of Standards) daylight availability database
[PB84-245745] N85-16688
IMAGE ANALYSIS
Integrated analysis of remote sensing products from basic geological surveys — Brazil
[E85-10052] N85-16248
LANDSAT-4 Thematic Mapper Modulation Transfer Function (MFT) evaluation — California and New Mexico
[E85-10055] N85-16250
Proceedings of the Second Annual Symposium on Mathematical Pattern Recognition and Image Analysis Program
[E85-10056] N85-16251
Estimating location parameters in a mixture N85-16252
Nonparametric analysis of Minnesota spruce and aspen tree data and LANDSAT data N85-16253
Texture classification using autoregressive filtering N85-16254
Bayesian estimation of normal mixture parameters N85-16255
Spatial estimation from remotely sensed data via empirical Bayes models N85-16256
Evidence accumulation for spatial reasoning N85-16261
Power spectral ensity of markov texture fields N85-16262
Rectification of single and multiple frames of satellite scanner imagery using points and edges as control N85-16263
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Image-to-image correspondence: Linear structure matching N85-16266
Metric aspects of digital images and digital image processing
[AD-A147211] N85-16276
IMAGE CONTRAST
Comments on the image contrast from inelastically scattered electrons
[DE85-000899] N85-16609
IMAGE MOTION COMPENSATION
Study of alternate optical and fine guidance sensor designs for the space infrared telescope facility (SIRTF)
[NASA-CR-166614] N85-15794

IMAGE PROCESSING
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program
[AD-A146771] N85-15951
White-light optical information processing and holography
[AD-A146938] N85-16138
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10044] N85-16244
Integrated analysis of remote sensing products from basic geological surveys — Brazil
[E85-10052] N85-16248
Metric aspects of digital images and digital image processing
[AD-A147211] N85-16276
Enhancement of multispectral scanner images by digital filtering
[ESA-TT-624] N85-16284
JPL Robotics Laboratory computer vision software library
[NASA-CR-174272] N85-16491
Surface reconstruction preserving discontinuities
[AD-A146741] N85-16526
Ultrasonic measurements, X-ray photographs and image processing
[BLL-RISLEY-TR-4586-(9091.9F)] N85-16583
Rule-based evidence accrual system for image understanding
[AD-A147835] N85-16634
Manual and automated line generalization and feature displacement: Appendixes
[AD-A143251] N85-16689

IMAGE RESOLUTION
A study on the imaging potential of QUASAT — spaceborne VLBI N85-16707
Potential affiliate stations to work with the EVN — European VLBI Network; QUASAT N85-16706

IMAGERY
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Analysis of subpixel registration N85-16267

IMAGES
Matrix display simulation
[AD-D011371] N85-16695

IMAGING TECHNIQUES
Image-to-image correspondence: Linear structure matching N85-16266
The electronic typesetting program programmer's manual
[AD-A147500] N85-16508
Use of the analytic signal in ultrasonic imaging
[DE84-016843] N85-16598

IMIDES
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892

IMMUNITY
Induction of immunity to toxins with anti-idiotypic antibody
[AD-A146793] N85-16445

IMMUNOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416

IMPACT STRENGTH
Proceedings of the International Conference and Exposition on Structural Impact and Crashworthiness
[AD-A147845] N85-15703

IMPURITIES
Determination of moments of initial estimate during linear approximation of distribution of ejected impurity N85-16045
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046

IN-FLIGHT MONITORING
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Flight parameters recording for structure fatigue life monitoring N85-15682
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683

INCIDENCE
The effect of changes in the angle of incidence in the event of a richochet at a float step
[RAE-TRANS-2120] N85-15712

INCINERATORS
Description and operation of a thermal decomposition unit-gas chromatographic system
[PB84-246362] N85-16146

INCLUSIONS
Investigation of granules of molybdenum-base alloys obtained with pulsed discharges
[BLL-M-36012-(5828.4)] N85-15871

INCOMPRESSIBILITY
Nonlinear waves in a rod. Results for incompressible elastic materials
[AD-A147485] N85-16216

INCOMPRESSIBLE FLOW
Laminar flow over a backward-facing step
[AD-A147469] N85-16084
Numerical solutions for steady natural convection in a square cavity
[PB84-245752] N85-16090

INCOMPRESSIBLE FLUIDS
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147463] N85-16554

INCONEL (TRADEMARK)
Inconel 718 alloy resistance to crack propagation N85-15740
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
Thermal-mechanical fatigue crack growth in Inconel X-750
[NASA-CR-174740] N85-15877
Possibilities for a more accurate life prediction of components — gas turbine disks N85-16196

INDEPENDENT VARIABLES
Some applications of penalty functions in mathematical programming
[AD-A147443] N85-16552

INDEXES (RATIOS)
Index cycles simulated by a low order forced barotropic model N85-16364

INDUSTRIAL ENERGY
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300

INDUSTRIAL MANAGEMENT
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681

INDUSTRIAL PLANTS
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300

INDUSTRIAL SAFETY
Facility safety study
[NASA-CR-174280] N85-15759
High voltage effects measured on dummy mannequin N85-16432
A crew exposure study. Volume 1: Offshore
[AD-A146884] N85-16449

INDUSTRIES
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929

INELASTIC SCATTERING
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606
Comments on the image contrast from inelastically scattered electrons
[DE85-000699] N85-16609

INEQUALITIES
Stable monotone variational inequalities
[AD-A147123] N85-16544

INERTIAL GUIDANCE
Polaris guidance system
[AD-D011324] N85-15704

INERTIAL NAVIGATION
A discussion of coning errors exhibited by inertial navigation systems
[AD-A147846] N85-15708
Errors of analog of inertial coordinate systems modeled in astronavigation system N85-16028

INFERENCE
Ambiguity and uncertainty in probabilistic inference
[AD-A147378] N85-16572

INFORMATION DISSEMINATION
Oceanographic data for development of the US exclusive economic zone
[PB85-106458/GAR] N85-16415

INFORMATION MANAGEMENT
Use of minicomputers for the formation of hydrological data banks N85-16358
Document interchange format
[PB84-217033] N85-16517
A study of the relationship between user attitudes and the success of the MAJCOM and AFRCE work information management system
[AD-A146956] N85-16571
Organizations and information processing: A field study of research and development units within the United States Air Force Systems Command
[AD-A147381] N85-16691

INFORMATION RETRIEVAL
Distributed knowledge base systems for diagnosis and information retrieval
[AD-A146890] N85-16690

INFORMATION THEORY
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications
[E85-10057] N85-16268
Rule-based evidence accrual system for image understanding
[AD-A147835] N85-16634
On the complexity of distributed decision problems
[AD-A147174] N85-16674

INFRARED ASTRONOMY
SIRTF: The next step
[NASA-TM-86663] N85-16724

INFRARED DETECTORS
Data handling for the Spectral Radiometer (SPERAD)
[FOA-C-30368-E1,E4] N85-16145
Electro-optical target detection
[AD-D011366] N85-16617
Buried junction enhanced Schottky barrier device
[AD-D011399] N85-16635

INFRARED IMAGERY
An integrated remote sensing approach for identifying ecological range sites — parker mountain
[E85-10050] N85-16246
Rule-based evidence accrual system for image understanding
[AD-A147835] N85-16634

INFRARED LASERS
Upgrading flexible infrared waveguides
[AD-A146763] N85-16160
Design and testing of a refractive laser beam homogenizer
[AD-A146997] N85-16162
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643

INFRARED PHOTOGRAPHY
Astronomical applications of new infrared films N85-16111
Infrared presensitization photography
[AD-A146968] N85-16139

INFRARED RADIATION
Upgrading flexible infrared waveguides
[AD-A146763] N85-16160
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry
[E85-10040] N85-16241
SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas
[AD-A147528] N85-16641

INFRARED SPECTRA
Demonstration of transparent solar array module design
[NASA-CR-174257] N85-16302
Infrared emission and atomic transitions
[AD-A147840] N85-16607

INFRARED SPECTROSCOPY
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15846

INFRARED TELESCOPES
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793
Study of alternate optical and fine guidance sensor designs for the space infrared telescope facility (SIRTF)
[NASA-CR-166614] N85-15794
Pointing and control system design study for the space infrared telescope facility (SIRTF)
[NASA-CR-166612] N85-15795
SIRTF: The next step
[NASA-TM-86663] N85-16724

INFRARED WINDOWS
High temperature ultra-high vacuum infrared window seal
[AD-D011333] N85-15890
Continuum absorption by H2O in the 700-1200 cm(-1) and 2400-280 cm(-1) windows
[AD-A147391] N85-16334

INGESTION (ENGINES)
Temperature distortion generator for turboshaft engine testing
[NASA-TM-83748] N85-15858

INITIATORS (EXPLOSIVES)
Laser ignition of explosives
[FOA-C-20550-D1] N85-16173

INJURIES
Establishment of posture and working movements of pilot in air crash enquiries N85-16417

Fatal hemorrhagic shock and acetate solutions
[AD-A146754] N85-16444

INLET AIRFRAME CONFIGURATIONS
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812

INLET FLOW
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86696] N85-15725
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812
Current problems in turbomachinery fluid dynamics
[AD-A147127] N85-16074

INOCULATION
Induction of immunity to toxins with anti-idiotypic antibody
[AD-A146793] N85-16445

INORGANIC COMPOUNDS
High capacity inorganic oxyhalide electrochemical cell
[AD-D011321] N85-15845

INPUT/OUTPUT ROUTINES
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual — rocket nozzle and orbital plume flow fields
[NASA-CR-171828] N85-15803

INSERTION
Electronic module insertion and retraction mechanism
[AD-D011309] N85-16002

INSPECTION
Nondestructive inspection: Improved capabilities of technicians
[AD-A147388] N85-16196

INSTRUMENT FLIGHT RULES
National airspace review: Airport radar service area operational confirmation report
[DOT/FAA/AT-84/2] N85-15707

INSULATORS
Method for bonding insulator to insulator
[AD-D011340] N85-15891
Moisture absorbing anti-arcing coating and method for applying same
[AD-D011310] N85-15904
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
Two carrier dual injector apparatus
[AD-D011357] N85-16646

INTEGRAL EQUATIONS
Analytic and sequential feynman integrals on abstract Wiener and Hilbert spaces, and A Cameron-Martin formula. Revision
[AD-A146969] N85-16537

INTEGRALS
Analytic and sequential feynman integrals on abstract Wiener and Hilbert spaces, and A Cameron-Martin formula. Revision
[AD-A146969] N85-16537

INTEGRATED CIRCUITS
Characterization of MMIC devices for active array antennas
[NASA-TM-86907] N85-15779
Investigation of planar waveguides and components for millimeter-wave integrated circuits
[AD-A147380] N85-16005
Control technology for integrated circuit fabrication at Micro-Circuit Engineering, Incorporated, West Palm Beach, Florida
[PB85-100717/GAR] N85-16013
Linear wideband microwave amplifiers for monolithic integrated microcircuits N85-16051
Trends in development of software for computer-aided analysis of large-scale integrated circuits N85-16055

INTELLIGENCE
Conjunctive and disjunctive item response functions
[AD-A147815] N85-16561

INTERACTIVE CONTROL
Interactive color-graphics interface for energy monitoring and control systems
[AD-A147538] N85-16509

INTERCALATION
The 13C nuclear magnetic resonance in graphite intercalation compounds
[NASA-CR-174261] N85-16601

INTERFACE STABILITY
Instability of film boiling of moving liquids
[BLL-WH-603-(9091.9F)] N85-16056

INTERFACES
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties
[AD-A147504] N85-15829
Interactive color-graphics interface for energy monitoring and control systems
[AD-A147538] N85-16509

INTERFACIAL TENSION
Contact angle and surface tension measurements of a five-ring polyphenyl ether
[NASA-TM-86927] N85-15897

INTERFERENCE DRAG
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716

INTERFEROMETERS
Turbulence measurement interferometer apparatus
[AD-D011377] N85-16156

INTERGALACTIC MEDIA
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715

INTERGRANULAR CORROSION
Testing of non-alloyed and low-alloyed steels for their behaviour with respect to intercrystalline stress corrosion cracking
[BLL-RISLEY-TR-4546-(9091-9F)] N85-15861

INTERNAL COMBUSTION ENGINES
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program
[PB85-100931/GAR] N85-15928
Cooling system investigation of the 3-kW MEP models 016A, 021A, and 026A (60Hz, 400-Hz and 28-V dc) gasoline-engine-driven generator sets
[AD-A147571] N85-16185

INTERNATIONAL COOPERATION
Broadening the debate N85-15785
International involvement in a civilian space station program N85-15789
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929
Maritime prospecting, mining discussed N85-16226
The challenge of food production: The importance of climate N85-16361
The potential contributions of the World Climate Program (WCP) to the economies of developing countries N85-16371

INTERPOLATION
Robust prediction and interpolation for vector stationary processes, part 3
[AD-A147860] N85-16579

INTERPROCESSOR COMMUNICATION
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521
Decentralized control of scheduling in distributed systems
[AD-A147445] N85-16523

INTERSTELLAR GAS
The environment of active galactic nuclei N85-16712

INTERSTELLAR MASERS
The relevance of QUASAT to the star formation problem N85-16718
Galactic OH and H2O masers — QUASAT project N85-16719
Water maser outburst N85-16720
Water masers and distance measurements: The impact of QUASAT N85-16721

INTERSTELLAR SPACE
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715

INTERVALS
Bootstrap confidence intervals
[AD-A147572] N85-16559

INTESTINES
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427

INVENTORY MANAGEMENT
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system
[AD-A147121] N85-16673

INVERSIONS
A method for solving the inverse problem of transonic cascade flow
[AD-A146739] N85-15698

INVISCID FLOW
A comparative study of the nonuniqueness problem of the potential equation
[NASA-TP-2385] N85-15694
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
A second-order accurate parabolized Navier-Stokes algorithm for internal flows
[NASA-CR-174258] N85-16059

IODIDES
Structural and synthetic organosilicon chemistry
[AD-A147101] N85-15820

ION ACCELERATORS
Explosive emission cathode plasmas in intensive relativistic electron beam diodes
[AD-A147917] N85-16642

ION BEAMS
Extended performance technology study 30-cm thruster
[NASA-CR-168259] N85-15806
The (20)Ne interaction in extended matter
[NASA-TM-86312] N85-16728

ION ENGINES
Study on control of ion engine system
[EL-847] N85-15800

ION EXTRACTION
Extended performance technology study 30-cm thruster
[NASA-CR-168259] N85-15806

ION IMPLANTATION
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046
Ion implantation and laser processing of III-V compound semiconductors with applications to the fabrication of microwave devices
[AD-A146846] N85-16651
Laser annealing of ion implanted semiconductors
[AD-A146979] N85-16652
X-ray and backscattering analysis of ion implantation phenomena in GaAs and related compounds
[AD-A147449] N85-16659

ION MICROSCOPES
Ion microscopy of metals and semiconductors
[AD-A147118] N85-16626

ION PROPULSION
Study on control of ion engine system
[EL-847] N85-15800
Ion thruster project
[NASA-TM-77726] N85-15805

IONIC REACTIONS
Ionic reactions of atmospheric importance
[AD-A147354] N85-16333

IONIZATION CHAMBERS
Measurement of soft X-ray absorption spectra with a fluorescent ion chamber detector
[AD-A142213] N85-15838

IONIZING RADIATION
A total dose characterization of five commercial analog multiplexers
[AD-A146886] N85-15997
Chemical protection against ionizing radiation
[AD-A147822] N85-16457

IONOSPHERE
Influence of Faraday effect in ionosphere on nonmutuality of meteor radio channel N85-16037
Region 1 birkeland currents from a global MHD simulation of the magnetosphere
[AD-A147435] N85-16335

IONOSPHERIC DISTURBANCES
Ionospheric turbulence: Interchange instabilities and chaotic fluid behavior
[AD-A147810] N85-16337
Remote sensing of the high latitude ionosphere
[AD-A147881] N85-16405

IONS
Research relative to plasma transport across the magnetopause
[NASA-CR-174300] N85-16636

IRON
Procedure for investigating high-temperature properties of iron-ore materials
[BLL-M-36020-(5828.4)] N85-15868
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272

IRON ALLOYS
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36026-(5828.4)] N85-15855

IRON OXIDES
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase
[BLL-M-36023-(5828.4)] N85-15873

ISLANDS
Satellite photographs suggest arctic volcano N85-16239

ISOCYANATES
Moisture absorbing anti-arcing coating and method for applying same
[AD-D011310] N85-15904

ISOLATION
Battery control and fault detection method
[AD-D011384] N85-16307

ITERATION
An iterative scheme for linear complementarity problems
[AD-A147464] N85-16555

J

J-52 ENGINE
A Q-GERT network simulation model for examining pipeline time in the Navy's J-52 intermediate level jet engine repair cycle
[AD-A147269] N85-15663
J-85 ENGINE
Problems and possibilities for life extension in gas turbine components N85-15742
JACOBI MATRIX METHOD
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560
JAGUAR AIRCRAFT
Experiences obtained from service fatigue monitoring exercises N85-15672
JAMMING
Distributed reservation-based code division multiple access
[AD-A147007] N85-15957
Parallel processor configuration for adaptive antenna arrays
[AD-D011347] N85-15970
JET AIRCRAFT
Advanced fatigue monitoring on service aircraft N85-15671
Ground-effect analysis of a jet transport airplane
[NASA-TM-85920] N85-15687
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
JET PROVOST AIRCRAFT
Experiences obtained from service fatigue monitoring exercises N85-15672
JOSEPHSON JUNCTIONS
Transmission line biased coherent array of Josephson oscillators
[AD-D011323] N85-15979
JP-5 JET FUEL
Evaluation of jet fuel deposit kinetics. Lot 4
[AD-A147196] N85-15922
JUNCTION DIODES
Buried junction enhanced Schottky barrier device
[AD-D011399] N85-16635

K

KANSAS
The influence of the number of ground control points on the scene-to-map registration accuracy --- Kansas, Louisiana, Mississipp, and Missouri N85-16264
KENTUCKY
Image variance and spatial structure in remotely sensed scenes --- South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
KEROSENE
Aircraft wing fuel tank environmental simulator tests for evaluation of antimisting fuels
[FAA-CT-84-15] N85-15920
KETONES
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride
[AD-D011393] N85-15818
KEVLAR (TRADEMARK)
Ultrasonic analysis of spherical composite test specimens
[DE85-001591] N85-16197
KIDNEYS
Distribution of blood flow to brain, kidneys, gut, spleen and posterior extremities in cats in acute hypoxia N85-16434
KINEMATICS
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program
[PB85-100931/GAR] N85-15928
Automatic camera tracking for remote manipulators
[DE85-001897] N85-16187
Modeling of human motion by computer considering measurement errors in initial data N85-16429
KINETIC EQUATIONS
A propagator expansion method for solving linearized plasma kinetic equations with collisions
[AD-A147524] N85-16640
KINETIC THEORY
A propagator expansion method for solving linearized plasma kinetic equations with collisions
[AD-A147524] N85-16640
KINETICS
Evaluation of jet fuel deposit kinetics. Lot 4
[AD-A147196] N85-15922
Variation in photosynthesis with light level for model with two photochemical reactions N85-16430
KLYSTRONS
Quasi-optical harmonic gyrotron and gyroklystron
[AD-D011308] N85-16001
KNOWLEDGE
Distributed knowledge base systems for diagnosis and information retrieval
[AD-A146890] N85-16690
KOREA
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea
[AD-A147204] N85-16397

L

LABYRINTH SEALS
Repair welding and brazing procedures for turbine components and investigation of the brazing behavior of thin filler foils
[MTU-TB-908/84] N85-16190
LAKES
In-lake water quality management for Lake Eureka: Highlights of third year (1983) operation
[PB85-104149/GAR] N85-16289
LAMINAR BOUNDARY LAYER
Some important problems in unsteady boundary layers including separation. 1: Nature of singularity on oscillating airfoils
[AD-A147897] N85-16087
LAMINAR FLOW
Laminar flow over a backward-facing step
[AD-A147489] N85-16084
LAMINAR HEAT TRANSFER
Laminar heat-transfer distributions on biconics at incidence in hypersonic-hypervelocity flows
[NASA-TP-2213] N85-16065
LAMINATES
A study of the stress wave factor technique for the characterization of composite materials
[NASA-CR-174219] N85-15821
A study of interply layer effects on the free-edge stress field of angleplied laminates
[NASA-TM-86924] N85-15822
Design procedures for fiber composite structural components: Panels subjected to combined in-plane loads
[NASA-TM-86909] N85-15823
LAND ICE
Diurnal freeze-thaw frequencies in selected regions of the high latitudes
[AD-A147276] N85-16400
LAND USE
Detecting agricultural to urban land use change from multi-temporal MSS digital data --- Salt Lake County, Utah
[E85-10049] N85-16245
Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications
[E85-10057] N85-16268
LANDING LOADS
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
LANDMARKS
Man in Space: National Historic Landmark Theme Study
[PB85-107233/GAR] N85-15768
LANDSAT 4
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications
[E85-10057] N85-16268
LANDSAT 5
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications
[E85-10057] N85-16268
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5
[E85-10059] N85-16270
Thematic Mapper. Volume 2: Flight model preshipment review
[E85-10060] N85-16271
LAPLACE TRANSFORMATION
Omni transforms: Applications to renewal theory
[AD-A146939] N85-16534
LARGE SCALE INTEGRATION
Compository speech output (KOSA) with a very large scale integration speech synthesis chip
[FI-13-TBR-18] N85-15974
Development of a 2 micrometer silicon-gate-CMOS-technology for microcomputer oriented VLSI circuits with a supply voltage range between 1.5 and 5 V
[BMFT-FB-T-84-203] N85-16012
Trends in development of software for computer-aided analysis of large-scale integrated circuits N85-16055
LARGE SPACE STRUCTURES
Broadening the debate N85-15785
Toward a goal-oriented civilian space program N85-15786
Results of principal NASA studies on space station uses and functional requirements N85-15787
Space Station truss structures and construction considerations
[NASA-TM-86338] N85-15796
LARVAE
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422
LARYNX
Metallic aid and technique in fitting voice prosthesis
[AD-D011356] N85-16442
LASER ANNEALING
Laser annealing of ion implanted semiconductors
[AD-A146979] N85-16652
LASER APPLICATIONS
Sputtering in thin film technology for optics --- laser systems N85-15948
Laser generation of ultrasonic waveform reconstructions
[AD-D011314] N85-16003
Spacecraft system study: A study to define the impact of laser communication systems on their host spacecraft
[NASA-CR-175272] N85-16159
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas
[AD-A147481] N85-16170
Laser ignition of explosives
[FOA-C-20550-D1] N85-16173
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
Ion implantation and laser processing of III-V compound semiconductors with applications to the fabrication of microwave devices
[AD-A146846] N85-16651
Laser annealing of ion implanted semiconductors
[AD-A146979] N85-16652
Research and technology, 1984 report
[NASA-TM-83096] N85-16730
LASER CAVITIES
External cavity diode laser sensor
[AD-D011341] N85-16152
LASER DAMAGE
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
LASER DOPPLER VELOCIMETERS
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
LASER GYROSCOPES
Flight testing of Litton laser gyro strapdown system LTN-90 for general aviation
[DFVLR-MITT-84-16] N85-15709
LASER INTERFEROMETRY
Turbulence measurement interferometer apparatus
[AD-D011377] N85-16156
LASER OUTPUTS
RF laser array driver apparatus
[AD-D011375] N85-16155
Delta wing nozzle assembly for chemical lasers
[AD-D011396] N85-16158
Design and testing of a refractive laser beam homogenizer
[AD-A146997] N85-16162
Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens
[AD-D011311] N85-16163
Theoretical study of laser-induced surface excitations on a grating
[AD-A147855] N85-16172
Measurement of high temperature strain by the laser-speckle strain gauge
[NASA-TM-77751] N85-16207
Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16838
LASER PLASMAS
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment
[AD-A147006] N85-16210

SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas
[AD-A147528] N85-16641
LASER SPECTROSCOPY
Laser spectroscopy of alkali atom-tetrahaloethylene reactions
[AD-A147431] N85-15848
LASER TARGET INTERACTIONS
Self-generated magnetic fields and thermal flux inhibition
[AD-A147405] N85-16166
LASER WINDOWS
Pulsed electric discharge laser technology. Electron beam window foil material
[AD-A147488] N85-16171
LASERS
External cavity diode laser sensor
[AD-D011341] N85-16152
RF laser array driver apparatus
[AD-D011375] N85-16155
Laser R and D in the armed services
[AD-A146930] N85-16161
Bragg cell spectrum analyzer specification
[AD-D011320] N85-16629
LATE STARS
Spectrophotometry of cool stars from objective prism spectra N85-16134
LATERAL OSCILLATION
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
LATERAL STABILITY
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing
[NASA-TM-85674] N85-15695
LATTICE PARAMETERS
Understanding the high pressure properties of molecular solids and molecular surfaces deposited on hetrogeneous substrates
[NASA-CR-174262] N85-16649
LATTICES (MATHEMATICS)
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697
Lattice statistics
[AD-A146862] N85-16530
LAUNCHING
Voice command weapons launching system
[AD-D011378] N85-15940
LAW (JURISPRUDENCE)
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684
LAYERS
Determination of parameters of doped thin semiconductor layers from plasmatic minimum of reflection coefficient for infrared radiation N85-16047
Antiicoiling technology: Theories of surface soiling and performance of antiicoiling surface coatings
[NASA-CR-174274] N85-16296
LEAD (METAL)
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825
LEAD ACID BATTERIES
Composite batteries N85-15932
LEAKAGE
Identification of leaks: Internal acoustic method, phase 2
[PB85-101947/GAR] N85-15927
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
LEARNING
Conjunctive and disjunctive item response functions
[AD-A147815] N85-16561
LEARNING MACHINES
Decentralized control of scheduling in distributed systems
[AD-A147445] N85-16523
LEAST SQUARES METHOD
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
Optimization of orientation in navigation by two heavenly bodies N85-16027
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147463] N85-16554
LEAVES
Changes in spectral properties of detached leaves
[E85-10042] N85-16243
LEG (ANATOMY)
Comparison of thermal responses between rest and leg exercise in water
[AD-A146818] N85-16448
LENSES
A low-sidelobe space feed lens
[AD-A147883] N85-15972
Helmet mounted telescope
[AD-D011355] N85-16467
LIABILITIES
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684
LIBRARIES
The UK Schmidt telescope and the facilities in Edinburgh N85-16121
LIFE (DURABILITY)
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
Monitoring engine thermal stresses N85-15735
Accelerated Mission Endurance Testing (AMET) N85-15736
Inconel 718 alloy resistance to crack propagation N85-15740
Cumulative damage modeling of fatigue crack growth N85-15741
Problems and possibilities for life extension in gas turbine components N85-15742
Engine cyclic durability by analysis and material testing N85-15744
Life prediction at high temperature under multiaxial loading N85-15745
Verification of life prediction through component testing N85-15748
CFM 56-2. Oligocyclic fatigue of the turbofan disk: Dimensionning and tests for verification and improvements N85-15750
View of future requirements for engine cyclic durability by analysis and testing N85-15751
Ensuring required metrological reliability of analog instrument channels by parametric compensation N85-16050
LIFE CYCLE COSTS
Accelerated Mission Endurance Testing (AMET) N85-15736
Concept and cost analysis of an orbiting lunar station
[ILF-MITT-138] N85-15776
Life cycle cost management master plan for the Defense Communications Agency
[AD-A146876] N85-16668
LIFE SCIENCES
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-027] N85-16426
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
LIFTING BODIES
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations
[NASA-CR-174299] N85-15690
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697
LIGHT (VISIBLE RADIATION)
Improved radiographic viewing system
[AD-A147587] N85-16456
Switchable zero order diffraction gratings as light valves
[AD-A147575] N85-16633
LIGHT SCATTERING
A study of structural phase transitions using light scattering techniques
[AD-A147261] N85-16654
LIGHT SCATTERING METERS
Apparatus for determining the liquid water content of a gas
[AD-D011297] N85-15839
LIGHT VALVES
Switchable zero order diffraction gratings as light valves
[AD-A147575] N85-16633
LIGHTNING
International Aerospace and Ground Conference on Lightning and Static Electricity. 1984 technical papers. Supplement
[NASA-CP-2356] N85-16343
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345
Lightning research: A user's lament N85-16346
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
A comparison of lightning and nuclear electromagnetic pulse response of tactical shelters N85-16350
LIKELIHOOD RATIO
On the power functions of test statistics in order restricted inference
[AD-A147126] N85-16566
LINEAR ACCELERATORS
Calculated parameters for the initial part of an accelerator with high-frequency quadrupole focusing
[RAE-TRANS-2122] N85-16600
LINEAR EQUATIONS
Feedback, adaptivity and A-posterior estimates in finite elements: Aims, theory and experience
[AD-A146869] N85-16531
LINEAR PROGRAMMING
An iterative scheme for linear complementarity problems
[AD-A147464] N85-16555
Extracting embedded generalized networks from linear programming problems
[AD-A147565] N85-16558
LINEAR TRANSFORMATIONS
Transformation of electromagnetic waves in plasma with randomly-heterogeneous magnetic field N85-16039
LINEAR VIBRATION
Nonlinear wave propagation study
[AD-A147011] N85-16329
LINEARITY
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
Digital thermometer with linearizer on slide wire N85-16049
Image-to-image correspondence: Linear structure matching N85-16266
LINGUISTICS
Neuro-linguistic programming: Eye movements as indicators of representational systems
[AD-A147541] N85-16454
LIPIDS
The lipid composition and its alteration during the growth stage in pathogenic fungus, epidermophyton floccosum
[NASA-TM-77440] N85-16421
Liposome-encapsulated hemoglobin for emergency resuscitation
[AD-A146794] N85-16448
LIQUEFIED NATURAL GAS
Risks in the transport and storage of liquefied natural gas. Sub-project 5-2: Investigation into building damage
[BLL-RISLEY-TR-4608-(9091.9F)] N85-15926
LIQUID CRYSTALS
Synthesis and characterization of unique liquid crystalline block copolyesters. A proposal for a polymer research center at the Atlanta University
[AD-A147280] N85-15907
Matrix display simulation
[AD-D011371] N85-16695
LIQUID FLOW
Instability of film boiling of moving liquids
[BLL-WH-603-(9091.9F)] N85-16056
LIQUID FUELS
Liquid-fueled Ramjet engines N85-15814
LIQUID OXYGEN
Ultrasound instrumentation for the 7 inch Mach seven tunnel
[NASA-CR-174277] N85-16586
LIQUID SURFACES
Free surface effects on the wake of a flat plate
[AD-A146988] N85-16071
LIQUID-VAPOR EQUILIBRIUM
Study of the liquid vapor equilibrium in the bromine-hydrobromic acid-water system
[NASA-TM-77787] N85-15836
LIQUIDS
Stability of rigid motions and rollers in bicomponent flows of immiscible liquids
[AD-A147302] N85-16081
Convection heat transfer in the critical region of fluid mixtures
[DE85-002118] N85-16088
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
LIQUIDUS
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
LITHIUM
Rechargeable lithium cell
[AD-D011302] N85-16304
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606
LITHIUM CHLORIDES
High capacity inorganic oxyhalide electrochemical cell
[AD-D011321] N85-15845

Synthesis and properties of Hexachloromolybdates(5) and related species
[AD-A139599] N85-15852

LITHIUM COMPOUNDS
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850

LITHIUM NIOBATES
Multichannel electrooptical modulators for digital information storage and processing systems N85-16021

LITHOGRAPHY
Development of short gate FET's
[AD-A147033] N85-15999

LOAD DISTRIBUTION (FORCES)
Evaluation of operational loads to verify structural design N85-15677

LOADS (FORCES)
Operational Loads Data
[AGARD-CP-375] N85-15664
Experiences obtained from service fatigue monitoring exercises N85-15672
CF-5 vertical stabilizer flight load survey N85-15673
US Army helicopter operational flight loads N85-15675
Helicopter data acquisition in WHL N85-15676
Influence of pressure on compaction during compression of powders of iron and 40Kh and 10R6MS steels
[BLL-M-35995-(5828.4)] N85-15866
Nondestructive measurement of bulk residual stresses
[AD-A147063] N85-16211
Development of large wind energy power generation system
[NASA-TM-77779] N85-16301

LOCKING
A simulator for determining the performance of transaction manager and lock manager combinations in a database
[AD-A147827] N85-16696

LOGISTICS
Distribution and storage of aviation turbine fuel for military operations in northern Australia
[AD-A147180] N85-15921

LOGISTICS MANAGEMENT
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16667
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models
[AD-A147329] N85-16676

LONG RANGE WEATHER FORECASTING
Forecasting water temperature decline and freeze-up in rivers
[AD-A147068] N85-16274

LOSSES
An improved computer model for prediction of axial gas turbine performance losses
[NASA-CR-174246] N85-15724

LOUISIANA
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Louisiana, parts A-F
[AD-A146920] N85-16391

LOW FREQUENCIES
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer
[AD-A147438] N85-15965
Detection of low frequency impulsive noise from large wind turbine generators
[NASA-CR-172511] N85-16588

LOW NOISE
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010

LOW REYNOLDS NUMBER
The resistance and mobility functions of two equal spheres in low Reynolds number flow
[AD-A147301] N85-16080

LOW TEMPERATURE
Method for making alloy additions to base metals having higher melting points
[AD-D011403] N85-15884
Effects of low temperatures on the growth and unfrozen water content of an aquatic plant
[AD-A147107] N85-16424
Carotid baroreceptor influences on peripheral circulatory and thermal responses during cold exposure
[AD-A146806] N85-16447

LOW TEMPERATURE ENVIRONMENTS
Effects of restricted water intake on performance in a cold environment
[AD-A146904] N85-16450

LUBRICANTS
Contact angle and surface tension measurements of a five-ring polyphenyl ether
[NASA-TM-86927] N85-15897
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099
Toxic hazards research
[AD-A147857] N85-16425

LUBRICATING OILS
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184

LUBRICATION
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184

LUMINANCE
NBS (National Bureau of Standards) daylight availability database
[PB84-245745] N85-16688

LUMINOUS INTENSITY
Central regulation of sensory flow in human visual system N85-16435

LUNAR BASES
Lunar nuclear power feasibility study
[NASA-CR-171831] N85-16611

LUNAR EXPLORATION
Concept and cost analysis of an orbiting lunar station
[ILF-MITT-138] N85-15776

LUNAR RADIATION
Natural interference phenomena affecting spaceborne receivers
[NASA-CR-174256] N85-15798

LUNAR SATELLITES
Concept and cost analysis of an orbiting lunar station
[ILF-MITT-138] N85-15776

M

MACH NUMBER
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697

MACHINE TOOLS
Power of deterministic thinking in machine tool accuracy
[DE85-001751] N85-16188

MAGNESIUM
Combustion properties of fuel-rich magnesium propellants with HTPB as binder
[FOA-C-20555-D1] N85-15924

MAGNESIUM ALLOYS
Application of the diffraction model to amorphous magnesium zinc alloys
[AD-A147369] N85-15883

MAGNESIUM OXIDES
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896

MAGNETIC ANOMALIES
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272

MAGNETIC EFFECTS
The determination of vertical sintering speed of sinter charges
[BLL-M-36033-(5828.4)] N85-15869

MAGNETIC FIELDS
Axisymmetric electromagnetic field influence on the characteristic velocity of an arc-jet
[NASA-TM-77475] N85-15942
Slow surface magnetoplasma waves in oblique magnetic field N85-16034
Transformation of electromagnetic waves in plasma with randomly-heterogeneous magnetic field N85-16039
Amplitude mode magnetic sensors
[AD-D011335] N85-16094
Self-generated magnetic fields and thermal flux inhibition
[AD-A147405] N85-16166
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment
[AD-A147006] N85-16210
Ionospheric turbulence: Interchange instabilities and chaotic fluid behavior
[AD-A147810] N85-16337
A low perturbation electron injector for cyclic accelerators
[AD-D011312] N85-16604

MAGNETIC MEASUREMENT
Amplitude mode magnetic sensors
[AD-D011335] N85-16094
External cavity diode laser sensor
[AD-D011341] N85-16152

MAGNETIC MOMENTS
Electronic structure and properties of magnetic defects in Co(1+x)Al(1-x) and Fe(1+x)Al(1-x) alloys
[NASA-TM-77498] N85-16648

MAGNETIC PERMEABILITY
Electronic structure and properties of magnetic defects in Co(1+x)Al(1-x) and Fe(1+x)Al(1-x) alloys
[NASA-TM-77498] N85-16648

MAGNETIC PROPERTIES
The growth of metastable perfiectic compounds
[NASA-CR-171289] N85-15824

MAGNETIZATION
Electronic structure and properties of magnetic defects in Co(1+x)Al(1-x) and Fe(1+x)Al(1-x) alloys
[NASA-TM-77498] N85-16648

MAGNETOHYDRODYNAMIC GENERATORS
Khibiny experiment described N85-16230

MAGNETOHYDRODYNAMIC STABILITY
The role of finite parallel length on the stability of barium clouds
[AD-A146972] N85-16328
Asymptotic behaviour of the plasma equation
[AD-A147242] N85-16549
Experimental results on Tokamak beta limits from ISX-B
[DE84-015372] N85-16644

MAGNETOHYDRODYNAMICS
Spicules and surges
[AD-A146785] N85-16727

MAGNETOMETERS
Amplitude mode magnetic sensors
[AD-D011335] N85-16094

MAGNETOPAUSE
Research relative to plasma transport across the magnetopause
[NASA-CR-174300] N85-16636

MAGNETOSPHERE
Region 1 birkeland currents from a global MHD simulation of the magnetosphere
[AD-A147435] N85-16335
Earth's radiation belts
[AD-A147927] N85-16339

MAGNETRONS
Rippled-field magnetron apparatus
[AD-D011354] N85-16154

MAINTENANCE
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators
[NAS-MD-790] N85-15705
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754
An analysis of the technical training of enlisted minuteman missile maintenance personnel
[AD-A147078] N85-15775
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16667
A simulation model for Air Launched Cruise Missile engine management
[AD-A147018] N85-16672
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models
[AD-A147329] N85-16676

MAINTENANCE TRAINING
An analysis of the technical training of enlisted minuteman missile maintenance personnel
[AD-A147078] N85-15775

MAN ENVIRONMENT INTERACTIONS
Education and training for the climate related activities in Latin America and the Caribbean N85-16379

MAN MACHINE SYSTEMS
Mental status in relation to special conditions of activity N85-16420
Interaction of human cognitive models and computer based models in supervisory control
[AD-A142547] N85-16474
Mental models and cooperative problem solving with expert systems
[AD-A147843] N85-16479

MANAGEMENT
Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements N85-15790
Distribution and storage of aviation turbine fuel for military operations in northern Australia [AD-A147180] N85-15921
Principles of multiobjective optimization [AD-A147520] N85-16679
Technical order managers handbook: Utilization assessment [AD-A147579] N85-16694

MANAGEMENT INFORMATION SYSTEMS
The effects of software quality control and baseline management on the acquisition of computer programs [AD-A147051] N85-16502
A study of the relationship between user attitudes and the success of the MAJCOM and AFRCE work information management system [AD-A146956] N85-16671

MANAGEMENT METHODS
Performance evaluation of A-10 aircraft mainteance units and aircraft using constrained facet analysis [AD-A146955] N85-15660
A Q-GERT network simulation model for examining pipeline time in the Navy's J-52 intermediate level jet engine repair cycle [AD-A147269] N85-15663
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models [AD-A147329] N85-16676

MANAGEMENT PLANNING
Decentralized control of scheduling in distributed systems [AD-A147446] N85-16487
The effects of software quality control and baseline management on the acquisition of computer programs [AD-A147051] N85-16502
The management of research institutions: A look at government laboratories [NASA-SP-481] N85-16665
Life cycle cost management master plan for the Defense Communications Agency [AD-A146876] N85-16668
Acquisition planning at the Defense Communications Agency [AD-A146877] N85-16669
A study of the relationship between user attitudes and the success of the MAJCOM and AFRCE work information management system [AD-A146956] N85-16671
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system [AD-A147121] N85-16673
Project manager's handbook for special projects [AD-A147913] N85-16683

MANAGEMENT SYSTEMS
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system [AD-A147121] N85-16673

MANGANESE
The growth of metastable peritectic compounds [NASA-CR-171289] N85-15824
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites [NASA-CR-171271] N85-15880

MANGANESE ALLOYS
Study of high performance alloy electroforming [NASA-CR-174276] N85-15875

MANIPULATORS
Precise control of flexible manipulators [NASA-CR-174210] N85-16178
Automatic camera tracking for remote manipulators [DE85-001897] N85-16187

MANNED SPACE FLIGHT
Man in Space: National Historic Landmark Theme Study [PB85-107233/GAR] N85-15768

MANPOWER
Parametric estimates of propulsion system maintenance manhours [AD-A147120] N85-15662

MANUFACTURING
The relationship between radiation sensitivity and redox equilibria — glass processing variables [AD-A147216] N85-15906
Fiat, Peugeot introduce integrated robotized engine: CAD used N85-15933

MAPPING
Manual and automated line generalization and feature displacement: Appendixes [AD-A143251] N85-16689

MARANGONI CONVECTION
High Marangoni number convection in a square cavity [NASA-CR-174263] N85-16076

MARINE BIOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-015] N85-16416

MARINE ENVIRONMENTS
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters [AD-A147574] N85-16404

MARINE RESOURCES
The use of hydrometeorological data in explaining shrimp cycles in Guyana N85-16381

MARKOV CHAINS
Limiting distributions of functionals of Markov chains [AD-A147832] N85-16577

MARKOV PROCESSES
Power spectral ensity of markov texture fields N85-16262

MARS (PLANET)
An autonomous roving vehicle for the planet Mars: A summary of over 15 years of research [RPI-TR-MP-83] N85-16179

MASERS
Passive maser using timesharing for control of the cavity and control of the oscillator on the line of stimulated emission [AD-D011326] N85-16151

MASS SPECTROSCOPY
An optical and mass spectrometric study of the aluminum-oxygen flame [AD-A147434] N85-15849

MATERIALS HANDLING
Multi-directional straddle-lift carrier [AD-D011315] N85-16183

MATERIALS RECOVERY
Microbiological method for the desiliconization of high-silica bauxites [BLL-MINTEK-TR-1168-(5810.5759)] N85-15864

MATERIALS SCIENCE
West Europe report: Science and technology [JPRS-WST-84-039] N85-15929

MATHEMATICAL LOGIC
Belief structures [AD-A147526] N85-16575

MATHEMATICAL MODELS
Tristatic tracking filter used by the multistatic measurement system [AD-A146885] N85-15769
Efficient computation of reflector antenna aperture distributions and far field patterns [AD-A147367] N85-15962
An asymptotic analysis of a transient p-n junction model [AD-A147270] N85-16004
Ensuring required metrological reliability of analog instrument channels by parametric compensation N85-16050
Trends in development of software for computer-aided analysis of large-scale integrated circuits N85-16055
Analysis of the heating process of a body in a melt [BLL-M-36014-(5828.4)] N85-16057
Numerical reconstruction of part of an actual blast-wave flow field to agree with available experimental data [UTIAS-TN-251] N85-16061
Numerical studies of interacting vortices [NASA-TM-86325] N85-16062
Growth/reflectance model interface for wheat and corresponding model [E85-10058] N85-16269
Forecasting water temperature decline and freeze-up in rivers [AD-A147068] N85-16274
Water and climate, study of one case N85-16369
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters [AD-A147574] N85-16404
Model robust response surface designs: Scaling 2-level factorials [AD-A147494] N85-16556
Conjunctive and disjunctive item response functions [AD-A147815] N85-16561
Response surface designs [AD-A147202] N85-16569
Current and current shear effects in the parabolic approximation for underwater sound channels [AD-A147833] N85-16597
Austrian contributions to fuel rod failure models shown at the International Standard Problem (ISP)-14 [OEFZS-4276] N85-16613
A simulation model for Air Launched Cruise Missile engine management [AD-A147018] N85-16672

MATHEMATICAL PROGRAMMING
Monotone operators in mathematical programming [AD-A147309] N85-16506

MATRICES (MATHEMATICS)
On a random difference equation for matrices and a characterization of the gamma distribution [AD-A146858] N85-16529
Lattice statistics [AD-A146862] N85-16530
Continuity of the null space basis and constrained optimization [AD-A147038] N85-16538
A complete characterization of triply balanced matrices with applications to survey sampling [AD-A147083] N85-16542
Extracting embedded generalized networks from linear programming problems [AD-A147565] N85-16558
Sequential and parallel matrix computations [AD-A147871] N85-16562
Structural optimization and other large-scale processes [AD-A147895] N85-16564

MATTER (PHYSICS)
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields [AD-A146854] N85-16602

MAXIMUM LIKELIHOOD ESTIMATES
More than you want to know about maximum likelihood estimation [NASA-TM-85905] N85-15752
Improved digital baseband transmission by application of maximum likelihood decoding to an 8-level signal generated by convolution and block coding [FI-44-TBR-93] N85-15973
Bayesian estimation of normal mixture parameters N85-16255
Local likelihood estimation [AD-A147317] N85-16571

MAXWELL EQUATION
Theoretical study of laser-induced surface excitations on a grating [AD-A147855] N85-16172

MAXWELL FLUIDS
Existence of slow steady flows of viscoelastic fluids with differential constitutive equations [AD-A147240] N85-16077

MEAN SQUARE VALUES
A complete characterization of triply balanced matrices with applications to survey sampling [AD-A147083] N85-16542

MEASURING INSTRUMENTS
Advanced fatigue monitoring on service aircraft N85-15671
The determination of vertical sintering speed of sinter charges [BLL-M-36033-(5828.4)] N85-15869
Gallium arsenide compounds tested nondestructively with X-rays N85-15934
Performance characteristics of a battery charger and state-of-charge indicator [NASA-CR-174273] N85-15992
Ensuring required metrological reliability of analog instrument channels by parametric compensation N85-16050
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture [NASA-TM-86898] N85-16096
A narrow band pulsed eddy current instrument for materials testing [AERE-R-11229] N85-16149

MECHANICAL ENGINEERING
Research and technology, 1984 report [NASA-TM-83096] N85-16730

MECHANICAL PROPERTIES
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties [AD-A147504] N85-15829
Austenitic stainless steel for high temperature and pressure applications [BLL-RISLEY-TR-4527-(9091.9F)] N85-15860
Design of ordered intermetallic alloys for high-temperature structural use [DE85-000897] N85-15885
Gradient polymers [AD-A146836] N85-15900
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures [PB85-100949/GAR] N85-15918

MECHANICAL SHOCK
The Shock and Vibration Digest, volume 16, no. 9 [AD-A146779] N85-16200

MEDICAL EQUIPMENT
Military vital sign monitor
[AD-A147257] N85-16452
Improved radiographic viewing system
[AD-A147587] N85-16456
MEDITERRANEAN SEA
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner
[AD-A147909] N85-16261
MELTING
Influence of temperatures of reactants on nature of product of solid-phase reactions
[BLL-M-36019-(5828.4)] N85-15832
Procedure for investigating high-temperature properties of iron-ore materials
[BLL-M-36020-(5828.4)] N85-15868
Diurnal freeze-thaw frequencies in selected regions of the high latitudes
[AD-A147276] N85-16400
MELTS (CRYSTAL GROWTH)
Calculation of energy of atomization in silicate tetrahedron Si4(4-)
[BLL-M-36000-(5828.4)] N85-16599
MEMBRANE STRUCTURES
Development of a preprototype times wastewater recovery subsystem, addendum
[NASA-CR-171823] N85-16468
MEMBRANES
Data appendix: F-number = 1.0 EMR with a flexible back electrode
[NASA-CR-172477] N85-15994
MEMORY
Effects of individual mnemonic characteristics on problem solving N85-16419
MENTAL HEALTH
Job and family stress as predictors of pilot health, job satisfaction and performance
[AD-A142176] N85-16464
MENTAL PERFORMANCE
Mental status in relation to special conditions of activity N85-16420
MERCURY ION ENGINES
Ion thruster project
[NASA-TM-77726] N85-15805
MESOSCALE PHENOMENA
An evaluation of an advection fog prediction model
[AD-A147436] N85-16403
Interactions between mean flow and finite-amplitude mesoscale eddies in a barotropic ocean
[AD-A147249] N85-16413
MESSAGE PROCESSING
Implementation of a constraint machine for prism - A parallel problem solver
[AD-A147844] N85-16512
METABOLISM
Comparison of thermal responses between rest and leg exercise in water
[AD-A146816] N85-16448
METAL CRYSTALS
Back stress in dislocation creep. Part 1: Basic concepts and measuring techniques
[NASA-TM-77773] N85-16206
METAL FATIGUE
Cumulative damage modeling of fatigue crack growth N85-15741
Thermal-mechanical fatigue crack growth in Inconel X-750
[NASA-CR-174740] N85-15877
METAL FILMS
Method for bonding insulator to insulator
[AD-D011340] N85-15891
METAL FOILS
Pulsed electric discharge laser technology. Electron beam window foil material
[AD-A147488] N85-16171
METAL MATRIX COMPOSITES
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties
[AD-A147504] N85-15829
METAL OXIDE SEMICONDUCTORS
Optics of solids (surface related) and effect of surface roughness on MOS
[AD-A146883] N85-15996
METAL POWDER
Influence of pressure on compaction during compression of powders of iron and 40Kh and 10R6MS steels
[BLL-M-35995-(5828.4)] N85-15866
METAL SURFACES
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896
Cryogenic glass-to-metal seal
[AD-D011370] N85-15911
Arc erosion of metal in current interval of 1-10 amperes N85-16042
METAL WORKING
Helicstat tested N85-16318
METAL-METAL BONDING
Investigation of the creep behaviour of soft soldered joints with solder L-SnAg5 at ambient temperature
[BLL-T6383/BG/WH798/84] N85-15865
METALLIC GLASSES
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium
[AD-A147888] N85-15915
METALLOGRAPHY
A metallographic investigation of rotating bands for 7.5 cm artillery projectiles
[FOA-C-20551-D2] N85-15888
METALLURGY
Method for making alloy additions to base metals having higher melting points
[AD-D011403] N85-15884
METALS
Analysis of the heating process of a body in a melt
[BLL-M-36014-(5828.4)] N85-16057
Measurement of high temperature strain by the laser-speckle strain gauge
[NASA-TM-77751] N85-16207
Ion microscopy of metals and semiconductors
[AD-A147118] N85-16626
METASTABLE ATOMS
Infrared emission and atomic transitions
[AD-A147840] N85-16607
METASTABLE STATE
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825
METEOR TRAILS
Influence of Faraday effect in ionosphere on nonmutuality of meteor radio channel N85-16037
METEOROIDS
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773
METEOROLOGICAL CHARTS
The 500 millibar sign frequency teleconnection charts: Winter
[PB85-106276/GAR] N85-16410
METEOROLOGICAL PARAMETERS
Climate applications: General N85-16355
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356
Climate and water quality N85-16368
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F
[AD-A146918] N85-16389
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Lousiana, parts A-F
[AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea
[AD-A147204] N85-16397
Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16398
Revised Uniform Summary of Surface Weather Observations (RUSSWO). O'Hare International Airport, Chicago, parts A-F
[AD-A147208] N85-16399
Interrelationship of atmospheric parameters in Honduras
[AD-A147371] N85-16401
METEOROLOGICAL RADAR
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar
[NASA-TM-86167] N85-16273
METEOROLOGICAL RESEARCH AIRCRAFT
NOAA (National Oceanic and Atmospheric Administration) Aircraft Satellite Data Link (ASDL)
[PB84-243773] N85-15976
METEOROLOGICAL SATELLITES
Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current
[AD-A147910] N85-16282
METEOROLOGICAL SERVICES
Climate and climate data. Report on the workshop held in Brasilia (Argentina) from 11-15 April 1983 N85-16357
Requirements for training in climate-related subjects N85-16378
METEOROLOGY
USSR report: Earth sciences
[JPRS-UES-84-008] N85-16223
METHANE
The structure of dilute combusting sprays
[NASA-CR-174838] N85-15728
The abundance of deuterium in the outer solar system from ground-based measurements of monodeuterated methane N85-16725
METHOD OF CHARACTERISTICS
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15801
METHODOLOGY
Method for making alloy additions to base metals having higher melting points
[AD-D011403] N85-15884
METHYLENE
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914
MEXICO
Socio-economic impact of climate — Mexico N85-16372
MICROBIOLOGY
Microbiological method for the desiliconization of high-silica bauxites
[BLL-MINTEK-TR-1168-(5810.5759)] N85-15864
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
MICROCHANNELS
The development and test of ultra-large-format multi-anode microchannel array detector systems
[NASA-CR-174247] N85-16622
MICROCOMPUTERS
Control system design language implementation of a gas turbine starting controller
[AD-A147896] N85-15732
Development of a 2 micrometer silicon-gate-CMOS-technology for microcomputer oriented VLSI circuits with a supply voltage range between 1.5 and 5 V
[BMFT-FB-T-84-203] N85-16012
Microcomputer control of a residential photovoltaic power conditioning system
[DE84-014774] N85-16488
Possibilities and impossibilities of microcomputer systems
[AD-1984-904] N85-16522
Ultrasound instrumentation for the 7 inch Mach seven tunnel
[NASA-CR-174277] N85-16586
MICROCRACKS
Salt action on concrete
[AD-A147812] N85-15912
Fundamentals of microcrack nucleation mechanics
[NASA-CR-3851] N85-16195
Influence of constant amplitude and variable amplitude loading on crack initiation and micro crack propagation in Al 2024-T3
[DFVLR-FB-84-29] N85-16220
MICRODENSITOMETERS
Recent developments on the COSMOS plate-scanning machine — microdensitometer N85-16128
Plate measurements and reductions at Muenster — astronomical photography N85-16129
First tests on the astrometric performance of the new PDS1010G at Hamburg Observatory — granite microdensitometer N85-16135
Astrometric applications of the Mt. Stromlo PDS 1010A — microdensitometer N85-16136
MICROELECTRONICS
Facility safety study
[NASA-CR-174280] N85-15759
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
Solid state research
[NASA-CR-174285] N85-16656
MICROHARDNESS
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896

MICROORGANISMS
A biological sensor for the detection of toxicants [AD-D011304] N85-16141
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427
MICROPROCESSORS
Control system design language implementation of a gas turbine starting controller [AD-A147896] N85-15732
A microprocessor data system for developing countries — climatology N85-16377
MICROSEISMS
Microseism level, time variations at Turkmen seismic stations studied N85-16231
MICROSTRUCTURE
The growth of metastable peritectic compounds [NASA-CR-171269] N85-15624
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys [BLL-M-36028-(5828.4)] N85-15855
Studies on copper alloys containing chromium on the copper side phase diagram [NASA-TM-77752] N85-15876
Fundamentals of microcrack nucleation mechanics [NASA-CR-3851] N85-16195
MICROWAVE AMPLIFIERS
Linear wideband microwave amplifiers for monolithic integrated microcircuits N85-16051
MICROWAVE ANTENNAS
Characterization of MMIC devices for active array antennas [NASA-TM-86907] N85-15779
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna [NASA-CR-174268] N85-15944
A low-sidelobe space feed lens [AD-A147883] N85-15972
Power transfer from natural emitters to collection apertures at microwave wavelengths [NASA-CR-174275] N85-15989
MICROWAVE CIRCUITS
Characterization of MMIC devices for active array antennas [NASA-TM-86907] N85-15779
Slow wave circuit with shaped dielectric substrate [AD-D011385] N85-15986
Investigation of planar waveguides and components for millimeter-wave integrated circuits [AD-A147380] N85-16005
MICROWAVE EMISSION
Power transfer from natural emitters to collection apertures at microwave wavelengths [NASA-CR-174275] N85-15989
MICROWAVE EQUIPMENT
Target detection using microwave irradiances from natural sources: A passive, local and global surveillance system [NASA-CR-174260] N85-15991
USSR report: Electronics and electrical engineering [JPRS-UEE-84-017] N85-16025
Investigation of the ice dynamics in the marginal ice zone [AD-A146729] N85-16411
Microwave resonator using lateral excitation [AD-D011374] N85-16596
MICROWAVE FILTERS
Dual mode directionally coupled band reject filter apparatus [AD-D011359] N85-15984
MICROWAVE RADIOMETERS
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program [AD-A146771] N85-15951
Spaceborne receivers: Basic principles [NASA-CR-174269] N85-15990
MICROWAVE SPECTRA
Cosmology N85-16701
MICROWAVE TUBES
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use [NASA-CR-174249] N85-16095
MICROWAVES
Natural interference phenomena affecting spaceborne receivers [NASA-CR-174256] N85-15798
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program [AD-A146771] N85-15951
Micro-waveguide transformers of coherent optical signals N85-16022
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
MILITARY AVIATION
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681
MILITARY HELICOPTERS
US Army helicopter operational flight loads N85-15675
Speed benefits of tilt-rotor designs for LHX [NASA-CR-166437] N85-15717
MILITARY OPERATIONS
Distribution and storage of aviation turbine fuel for military operations in northern Australia [AD-A147180] N85-15921
The Air Force can improve its forecasts of aircraft spare parts requirements [AD-A147911] N85-16682
Estimating wartime support resource requirements. Statistical and related policy issues [AD-A147923] N85-16685
MILITARY TECHNOLOGY
Laser R and D in the armed services [AD-A146930] N85-16161
MILKY WAY GALAXY
The galaxy scene and QUASAT — VLBI satellite N85-16703
MILLIMETER WAVES
MMIC devices for active phased array antennas [NASA-CR-174281] N85-15943
A quasi-optical method for measuring the complex permittivity of materials [AD-A147483] N85-15966
Investigation of planar waveguides and components for millimeter-wave integrated circuits [AD-A147380] N85-16005
Low-loss flexible dielectric waveguide for millimeter-wave transmission and its application to devices [AD-A147848] N85-16006
Development of a 30 GHz/1 kW broadband traveling wave tube with suppression of band edge oscillations [BMFT-FB-W-84-035] N85-16011
Rippled-field magnetron apparatus [AD-D011354] N85-16154
A new free electron laser using a relativistic beam with spiralling electron [AD-D011316] N85-16165
MINERAL DEPOSITS
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report [DE84-901335] N85-16283
MINERAL EXPLORATION
USSR report: Earth sciences [JPRS-UES-84-008] N85-16223
Maritime prospecting, mining discussed N85-16226
Exploring ocean's mineral wealth N85-16227
MINERALOGY
The mineralogy of global magnetic anomalies [E85-10061] N85-16272
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report [DE84-901335] N85-16283
MINERALS
New data on presence of ores in salt dome structures of Dnieper-Donets Basin N85-16234
Geostatistics for resource and reserve estimation [PB85-105781/GAR] N85-16286
A study of structural phase transitions using light scattering techniques [AD-A147261] N85-16654
MINICOMPUTERS
Use of minicomputers for the formation of hydrological data banks N85-16358
MINING
Geostatistics for resource and reserve estimation [PB85-105781/GAR] N85-16286
MINUTEMAN ICBM
An analysis of the technical training of enlisted minuteman missile maintenance personnel [AD-A147078] N85-15775
MIRAGE AIRCRAFT
Aeroelastic analysis and the identification of flight loads — Mirage 2000 aircraft N85-15879
MIRRORS
Evaluation of colorless polyimide film for thermal control coating applications [NASA-TM-86341] N85-15894
Reverse wave suppression in unstable ring resonator [AD-A146825] N85-15952
Unstable optical resonator with cancelling edge waves [AD-D011379] N85-16618
Mirror actuator control system [AD-D011383] N85-16619
MIS (SEMICONDUCTORS)
Aluminum nitride insulator for 3-5 MIS (Metal-Insulator-Semiconductor) applications [AD-A147842] N85-16662
MISSILE ANTENNAS
Hardwire missile receiver coupler [AD-D011350] N85-15936
MISSILE COMPONENTS
Hardwire missile receiver coupler [AD-D011350] N85-15936
MISSILE CONTROL
Polaris guidance system [AD-D011324] N85-15704
MISSILE LAUNCHERS
Hardwire missile receiver coupler [AD-D011350] N85-15936
MISSILES
Ramjet and Ramrocket Propulsion Systems for Missiles [AGARD-LS-136] N85-15809
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812
Special problems of Ramjet with solid fuel N85-15815
Solid propellant Ramrockets N85-15816
MISSION PLANNING
Commerce Laboratory: Mission analysis payload integration study [NASA-CR-171298] N85-15764
Results of principal NASA studies on space station uses and functional requirements N85-15787
Acquisition planning at the Defense Communications Agency [AD-A146877] N85-16669
QUASAT: A VLBI observatory in space — conferences [ESA-SP-213] N85-16700
MISSISSIPPI
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
MISSOURI
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
MIXING
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing [AD-A146827] N85-16623
MIXTURES
Properties of miscible polymer blends [AD-A147090] N85-15903
Convection heat transfer in the critical region of fluid mixtures [DE85-002118] N85-16088
MNEMONICS
Effects of individual mnemonic characteristics on problem solving N85-16419
MOBILITY
Electron distribution function and mobility in 3-5 compounds for high and low fields [AD-A147447] N85-16658
MODAL RESPONSE
F-8 refueling boom ground vibration test [NASA-TM-84914] N85-15713
MODE TRANSFORMERS
Transformation of mode composition of circular optical waveguide N85-16023
MODELS
A hydrogen partitioning model for hydrogen assisted crack growth [AD-A147385] N85-16214
General model of earthquakes and the place of warnings in it N85-16232
Model of team organization and behavior and team description method [AD-A147540] N85-16680
MODULATION
Reduction of signal modulation caused by polarization in visible optical scanning systems [AD-D011389] N85-16620
MODULATION TRANSFER FUNCTION
Spaceborne receivers: Basic principles [NASA-CR-174269] N85-15990
LANDSAT-4 Thematic Mapper Modulation Transfer Function (MFT) evaluation — California and New Mexico [E85-10055] N85-16250
MODULATORS
Multichannel electrooptical modulators for digital information storage and processing systems N85-16021
MODULES
Demonstration of transparent solar array module design [NASA-CR-174257] N85-16302
MODULUS OF ELASTICITY
Transformation toughened ceramics for the heavy duty diesel engine technology program [NASA-CR-174689] N85-16698

MOISTURE
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS)
[NASA-TP-2425] N85-16351
MOISTURE CONTENT
Apparatus for determining the liquid water content of a gas
[AD-D011297] N85-15839
Effects of low temperatures on the growth and unfrozen water content of an aquatic plant
[AD-A147107] N85-16424
MOLECULAR BEAM EPITAXY
Development of short gate FET's
[AD-A147033] N85-15999
Aluminum nitride insulator for 3-5 MIS (Metal-Insulator-Semiconductor) applications
[AD-A147842] N85-16662
MOLECULAR COLLISIONS
Chaos near the Coulomb Barrier: Nuclear molecules
[DE85-001280] N85-16608
MOLECULAR ENERGY LEVELS
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory
[AD-A147161] N85-15844
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606
MOLECULAR GASES
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
Understanding the high pressure properties of molecular solids and molecular surfaces deposited on hetrogeneous substrates
[NASA-CR-174262] N85-16649
MOLECULAR INTERACTIONS
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
MOLECULAR IONS
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
MOLECULAR ORBITALS
Application of quantum chemistry of atmospheric chemistry
[AD-A147035] N85-15843
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory
[AD-A147161] N85-15844
MOLECULAR SPECTROSCOPY
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
MOLECULAR STRUCTURE
Catalytic oxidation by transition metal ions in zeolites
[AD-A146828] N85-15842
MOLYBDATES
Synthesis and properties of Hexachloromolybdates(5) and related species
[AD-A139599] N85-15852
MOLYBDENUM
Special features of the deformation of molybdenum at high temperatures
[BLL-M-36027-(5828.4)] N85-15856
Investigation of granules of molybdenum-base alloys obtained with pulsed discharges
[BLL-M-36012-(5828.4)] N85-15871
MOLYBDENUM ALLOYS
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36028-(5828.4)] N85-15855
MOMENTS
Determination of moments of initial estimate during linear approximation of distribution of ejected impurity N85-16045
MONITORS
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Battery control and fault detection method
[AD-D011384] N85-16307
Military vital sign monitor
[AD-A147257] N85-16452
Interactive color-graphics interface for energy monitoring and control systems
[AD-A147538] N85-16509
MONOPOLE ANTENNAS
Compact wideband multiple conductor monopole antenna
[AD-D011331] N85-15981
MONOTONE FUNCTIONS
Stable monotone variational inequalities
[AD-A147123] N85-16544
MONTE CARLO METHOD
The effect of assumptions about cost element probability distributions on operating and support cost risk analysis
[AD-A147553] N85-16576
MOORING
The long term upper ocean study (LOTUS). Cruise summary and hydrographic data report, OCEANUS 154, May 1984
[AD-A147908] N85-16414
MORPHOLOGY
Rubber-modified epoxies. 1: Cure, transitions, and morphology
[AD-A147377] N85-15908
Effects of body mass and morphology on thermal responses in water
[AD-A147558] N85-16455
MOTION
Modeling of human motion by computer considering measurement errors in initial data N85-16429
MOUNTING
Mounting construction for turbine vane assembly
[AD-D011395] N85-15723
MOVING TARGET INDICATORS
Adaptive MTI (Moving Target Indicator) system
[AD-D011361] N85-15937
MRCA AIRCRAFT
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Flight parameters recording for structure fatigue life monitoring N85-15682
MULLITES
Transformation toughened ceramics for the heavy duty diesel engine technology program
[NASA-CR-174689] N85-16698
MULTICHANNEL COMMUNICATION
Multiwavelength bidirectional coupler-decouplers
[AD-A147009] N85-16625
MULTIMODE RESONATORS
Transformation of mode composition of circular optical waveguide N85-16023
MULTIPLE BEAM INTERVAL SCANNERS
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna
[NASA-CR-174268] N85-15944
MULTIPLEXING
A total dose characterization of five commercial analog multiplexers
[AD-A146886] N85-15997
Electro-optical target detection
[AD-D011366] N85-16617
MULTIPROCESSING (COMPUTERS)
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521
MULTISPECTRAL BAND SCANNERS
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10053] N85-16249
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications
[E85-10057] N85-16268
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5
[E85-10059] N85-16270
Thematic Mapper. Volume 2: Flight model preshipment review
[E85-10060] N85-16271
Enhancement of multispectral scanner images by digital filtering
[ESA-TT-824] N85-16284
Forest area estimates from LANDSAT MSS and forest inventory plot data
[PB85-105617/GAR] N85-16290
MULTISTATIC RADAR
Tristatic tracking filter used by the multistatic measurement system
[AD-A146885] N85-15769
MULTIVARIATE STATISTICAL ANALYSIS
The stable evaluation of multivariate b-splines
[AD-A147386] N85-16551
The symmetry group and exponents of operator stable probability measures
[AD-A147187] N85-16568
A factor analysis for time series
[AD-A147495] N85-16574
MUSCULOSKELETAL SYSTEM
Evaluation of the musculoskeletal diseases program
[PB84-230648] N85-16461

N

N-TYPE SEMICONDUCTORS
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15095
Diffusion barrier for long wavelength laser diodes
[AD-D011390] N85-16157
NACELLES
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812
NARROWBAND
A narrow band pulsed eddy current instrument for materials testing
[AERE-R-11229] N85-16149
NASA PROGRAMS
Issues and findings N85-15782
Financing considerations and Federal budget impacts N85-15792
NASTRAN
Investigation of the HPFTP first stage impeller crack
[NASA-CR-171281] N85-16208
NATIONAL AIRSPACE UTILIZATION SYSTEM
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators
[NAS-MD-790] N85-15705
NATURAL GAS
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287
USSR report: Energy
[JPRS-UEN-84-038] N85-16312
NAVIER-STOKES EQUATION
A second-order accurate parabolized Navier-Stokes algorithm for internal flows
[NASA-CR-174258] N85-16059
Computational analysis of scramjet dual mode operation
[NASA-CR-174250] N85-16060
Numerical studies of interacting vortices
[NASA-TM-86325] N85-16062
Development of a Navier-Stokes rotor and stator analysis
[AD-A146967] N85-16070
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147483] N85-16554
NEAR INFRARED RADIATION
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry
[E85-10040] N85-16241
NEAR WAKES
Unsteady flow characteristics in the near-wake of a two-dimensional obstacle
[NASA-TM-77762] N85-15684
Free surface effects on the wake of a flat plate
[AD-A146988] N85-16071
NEBRASKA
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Offutt AFB, Nebraska, parts A-F
[AD-A147183] N85-16304
NEODYMIUM LASERS
Design and testing of a refractive laser beam homogenizer
[AD-A146997] N85-16182
NEON ISOTOPES
The (20)Ne interaction in extended matter
[NASA-TM-86312] N85-16728
NERVES
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
NETHERLANDS
Synoptical observations of snow depths at Dutch meteorological stations, 1956 - 1977
[KNMI-TR-51] N85-16407
NETWORK ANALYSIS
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521
NETWORKS
Extracting embedded generalized networks from linear programming problems
[AD-A147585] N85-16558
NEUROPHYSIOLOGY
Lateral specifics of visual perception N85-16436
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa)
[AD-A147890] N85-16458
NEUTRAL ATMOSPHERES
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773

NEUTRAL ATOMS
Forces on neutral atoms due to electromagnetic fields [AD-A146984] N85-16603
NEUTRAL PARTICLES
Gas pressure and electron density in the active zone level of hollow cathode arc discharges [NASA-TM-77468] N85-15988
NEW MEXICO
LANDSAT-4 Thematic Mapper Modulation Transfer Function (MFT) evaluation — California and New Mexico [E85-10055] N85-16250
NICKEL
Comparison between the properties of conventional wrought and powder metallurgical alloys for turbine disc applications N85-15739
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system [NASA-TM-86905] N85-15878
Surface effects of corrosive media on hardness, friction, and wear of materials [NASA-TM-83711] N85-15896
Defective nature of the crystalline lattice of nickel ferrite-based solid solutions [BLL-WH-595-(9091.9F)] N85-16645
NICKEL ALLOYS
Problems and possibilities for life extension in gas turbine components N85-15742
Study of high performance alloy electroforming [NASA-CR-174276] N85-15875
Design of ordered intermetallic alloys for high-temperature structural use [DE85-000897] N85-15885
NIGHT SKY
The Malin effect in stellar photography N85-16131
NIMBUS 7 SATELLITE
Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner [AD-A147909] N85-16281
NITROGEN
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems [NASA-CR-174271] N85-15701
Nitrogen flushing during exposure of large Schmidt telescope plates N85-16109
NITROGEN DIOXIDE
Short-term human respiratory effects of nitrogen dioxide: Determination of quantitative dose-response profiles. Phase 2: Exposure of asthmatic volunteers to 4 PPM NO2 [PB85-104388/GAR] N85-16462
NITROGEN OXIDES
NOx emissions near a heat pump with gas motor [BLL-WH-782-(9091.9F)] N85-16319
NITROGEN PLASMA
SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas [AD-A147528] N85-16641
NOBLE METALS
The replacement of precious metal thick film inks using conductive polymer technology. Phase 1: Feasibility study [AD-A147814] N85-15913
NODULES
Exploring ocean's mineral wealth N85-16227
NOISE
NBS (National Bureau of Standards) and WR62 and WR90 reference noise standards [PB84-235704] N85-15977
NOISE (SOUND)
Detection of low frequency impulsive noise from large wind turbine generators [NASA-CR-172511] N85-16588
NOISE MEASUREMENT
Helicopter noise survey performed at Las Vegas, Nevada, 19-21 January, 1984 [AD-A147392] N85-16593
Noise measurement flight test: Data-analyses aerospatiale AS-355F TwinStar helicopter [AD-A147497] N85-16595
NOISE POLLUTION
NOISEMAP 4.4 computer program update, operator's manual, addendum 1 [AD-A147091] N85-16503
NOISE SPECTRA
Detection of low frequency impulsive noise from large wind turbine generators [NASA-CR-172511] N85-16588
NOISE TOLERANCE
NOISEMAP 4.4 computer program update, operator's manual, addendum 1 [AD-A147091] N85-16503
NONDESTRUCTIVE TESTS
Nondestructive deceleration of a rocket sled — target penetration tests [FOA-C-20549-D3] N85-15771
A study of the stress wave factor technique for the characterization of composite materials [NASA-CR-174219] N85-15821
Gallium arsenide compounds tested nondestructively with X-rays N85-15934
A narrow band pulsed eddy current instrument for materials testing [AERE-R-11229] N85-16149
Comparison of the sensitivities of ultrasonic, radiographic and acoustic emission test methods for the examination of a thick weld [BLL-RISLEY-TR-4547-(9091.9F)] N85-16194
Nondestructive inspection: Improved capabilities of technicians [AD-A147388] N85-16196
Nondestructive tests and fracture mechanics investigations in the Component Integrity Research Programme [BLL-RISLEY-TR-4541-(9091.9F)] N85-16199
Nondestructive measurement of bulk residual stresses [AD-A147063] N85-16211
Ultrasonic measurements, X-ray photographs and image processing [BLL-RISLEY-TR-4586-(9091.9F)] N85-16583
NONFLAMMABLE MATERIALS
Flame-resistant materials for use in pyrotechnic safety clothing [AD-A146857] N85-15901
NONLINEAR EQUATIONS
Trust region methods for minimization [AD-A147073] N85-16540
Self similar solutions for a degenerate Cauchy problem [AD-A147241] N85-16548
NONLINEAR FILTERS
Numerical methods and approximation and modelling problems in stochastic control theory [AD-A146927] N85-16533
NONLINEAR SYSTEMS
Techniques for nonlinear random vibration problems N85-16201
NONLINEARITY
Supersonic nonlinear potential analysis [NASA-CR-172456] N85-15685
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations [NASA-CR-174299] N85-15690
Nonlinear semigroups and evolution governed by accretive operators [AD-A147556] N85-16557
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing [AD-A146827] N85-16623
NONPARAMETRIC STATISTICS
Nonparametric analysis of Minnesota spruce and aspen tree data and LANDSAT data N85-16253
Bootstrap confidence intervals [AD-A147572] N85-16559
NORTH AMERICA
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry [DE85-001272] N85-16406
NORTH CAROLINA
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F [AD-A146918] N85-16389
NORWAY
Deployment of a regional array in Norway [AD-A147032] N85-16330
NOSE CONES
Laminar heat-transfer distributions on biconics at incidence in hypersonic-hypervelocity flows [NASA-TP-2213] N85-16065
NOSE TIPS
Erosion-resistant nosetip construction [AD-D011346] N85-15797
NOZZLE DESIGN
Delta wing nozzle assembly for chemical lasers [AD-D011396] N85-16158
NOZZLE FLOW
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems [NASA-CR-174271] N85-15701
A computer program for the performance analysis of scarfed nozzles [AD-A147370] N85-15730
Delta wing nozzle assembly for chemical lasers [AD-D011396] N85-16158
NUCLEAR FUEL ELEMENTS
Austrian contributions to fuel rod failure models shown at the International Standard Problem (ISP)-14 [OEFZS-4276] N85-16613
NUCLEAR FUEL REPROCESSING
Inquiry into disintegration control of irradiated low enrichment uranium for high temperature gas cooled reactors [OEFZS-7281] N85-16615
NUCLEAR FUELS
USSR report: Energy [JPRS-UEN-84-038] N85-16312
NUCLEAR INTERACTIONS
Chaos near the Coulomb Barrier: Nuclear molecules [DE85-001280] N85-16608
NUCLEAR MAGNETIC RESONANCE
The 13C nuclear magnetic resonance in graphite intercalation compounds [NASA-CR-174261] N85-16601
NUCLEAR RADIATION
Inquiry into disintegration control of irradiated low enrichment uranium for high temperature gas cooled reactors [OEFZS-7281] N85-16615
NUCLEAR REACTORS
The reactor dynamic code RETRANS: Structure and users guide [OEFZS-4287] N85-16614
NUCLEATION
Fundamentals of microcrack nucleation mechanics [NASA-CR-3851] N85-16195
NULL HYPOTHESIS
Continuity of the null space basis and constrained optimization [AD-A147038] N85-16538
On the power functions of test statistics in order restricted inference [AD-A147126] N85-16566
NULL ZONES
Parallel processor configuration for adaptive antenna arrays [AD-D011347] N85-15970
NUMERICAL ANALYSIS
Research in applied mathematics, numerical analysis, and computer science [NASA-CR-172505] N85-16480
Use of coordinate functions to calculate deformation fields [BLL-M-36010-(5828.4)] N85-16524
NUMERICAL CONTROL
Performance characteristics of a battery charger and state-of-charge indicator [NASA-CR-174273] N85-15992
Passive maser using timesharing for control of the cavity and control of the oscillator on the line of stimulated emission [AD-D011326] N85-16151
NUTRITION
Feasibility of producing a range of food products from a limited range of undifferenitiated major food components [NASA-CR-177329] N85-16473
NUTRITIONAL REQUIREMENTS
Problems associated with the utilization of algae in bioregenerative life support systems [NASA-CR-166615] N85-16469
NYLON (TRADEMARK)
Temperature dependence of the crystal structures of Nylon 11 [AD-A147583] N85-16661

O

OCEAN BOTTOM
Exploring ocean's mineral wealth N85-16227
Satellite photographs suggest arctic volcano N85-16239
Research of inverse methods to describe the structure of the earth and ocean bottom [AD-A147082] N85-16541
Ocean acoustics [AD-A147062] N85-16591
Arctic marine acoustics [AD-A147492] N85-16594
OCEAN CURRENTS
Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner [AD-A147909] N85-16281
Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current [AD-A147910] N85-16282
The problem of climate and climate variation N85-16353
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
The El Nino phenomenon and its agrometeorological implications N85-16382

A compilation of moored current meter and wind recorder data. Volume 35: Long-Term Upper Ocean Study (LOTUS) (Moorings 764, 765, 766, 767, 770), May 1982 - April 1983
[AD-A147103] N85-16412
The long term upper ocean study (LOTUS). Cruise summary and hydrographic data report, OCEANUS 154, May 1984
[AD-A147908] N85-16414
Current and current shear effects in the parabolic approximation for underwater sound channels
[AD-A147833] N85-16597

OCEAN MODELS
Interactions between mean flow and finite-amplitude mesoscale eddies in a barotropic ocean
[AD-A147249] N85-16413
Research of inverse methods to describe the structure of the earth and ocean bottom
[AD-A147082] N85-16541

OCEAN TEMPERATURE
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
A compilation of moored current meter and wind recorder data. Volume 35: Long-Term Upper Ocean Study (LOTUS) (Moorings 764, 765, 766, 767, 770), May 1982 - April 1983
[AD-A147103] N85-16412

OCEANOGRAPHIC PARAMETERS
The long term upper ocean study (LOTUS). Cruise summary and hydrographic data report, OCEANUS 154, May 1984
[AD-A147908] N85-16414

OCEANOGRAPHY
USSR report: Earth sciences
[JPRS-UES-84-008] N85-16223
Exploring ocean's mineral wealth N85-16227
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
Oceanographic data for development of the US exclusive economic zone
[PB85-106458/GAR] N85-16415

OCEANS
Interactions between mean flow and finite-amplitude mesoscale eddies in a barotropic ocean
[AD-A147249] N85-16413

OFFSHORE PLATFORMS
A crew exposure study. Volume 1: Offshore
[AD-A146884] N85-16449

ON-LINE SYSTEMS
Research activities of the Norwegian seismic array (NORSAR)
[AD-A146778] N85-16326

ONBOARD DATA PROCESSING
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681

OPERATING COSTS
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany
[ISSN-0722-3838] N85-16687

OPERATING SYSTEMS (COMPUTERS)
Operating system versus programming environment, for example the UNIX
[SWA-84/037] N85-16516

OPERATIONS RESEARCH
Principles of multiobjective optimization
[AD-A147520] N85-16679

OPERATOR PERFORMANCE
Speech-action interrelationships in operational work N85-15418

OPERATORS (MATHEMATICS)
Monotone operators in mathematical programming
[AD-A147309] N85-16506
An operator method for computing the asymptotics of a collision resolution interval
[AD-A146837] N85-16526
Nonlinear semigroups and evolution governed by accretive operators
[AD-A147556] N85-16557
The symmetry group and exponents of operator stable probability measures
[AD-A147187] N85-16568

OPERATORS (PERSONNEL)
Random pattern tracking acceleration tolerance tester
[AD-D011404] N85-16459

OPTICAL COMMUNICATION
Holographic directional coupler for fiber optic systems
[AD-D011365] N85-15939
Micro-waveguide transformers of coherent optical signals N85-16022
Nonlinear processing of optical pulse signals N85-16026
Analysis of threshold effects during estimation of arrival time of optical signals N85-16030
Potential effectiveness of spatial processing in detecting signals against background of interfering reflections N85-16032
Spacecraft system study: A study to define the impact of laser communication systems on their host spacecraft
[NASA-CR-175272] N85-16159

OPTICAL COUPLING
Multiwavelength bidirectional coupler-decouplers
[AD-A147009] N85-16625

OPTICAL DATA PROCESSING
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix
[AD-A146848] N85-15953
Modern signal processing and reconnaissance --- conferences
[FOA-C-30374-E1] N85-15975
White-light optical information processing and holography
[AD-A146938] N85-16138

OPTICAL DATA STORAGE MATERIALS
Multichannel electrooptical modulators for digital information storage and processing systems N85-16021

OPTICAL DENSITY
The calibration of photographic and spectroscopic films: A densitometric analysis of IIaO film flown aboard the Space Shuttle 3
[NASA-CR-174278] N85-16101

OPTICAL EQUIPMENT
Optics and opto-electronic systems
[AD-A147277] N85-16630

OPTICAL PROPERTIES
Optical properties of composite materials
[AD-A146768] N85-15828
Multiple scattering effects on transmission through the atmosphere
[AD-A147527] N85-15969
Comparison measurements on optical particle counters
[BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner
[AD-A147909] N85-16281
Optical RF downconverter
[AD-D011336] N85-16616
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing
[AD-A146827] N85-16623
Multiwavelength bidirectional coupler-decouplers
[AD-A147009] N85-16625

OPTICAL PUMPING
Intense excitation source of blue-green laser
[AD-A147450] N85-16168
High-power radiating plasma
[NASA-TM-77784] N85-16637

OPTICAL RESONATORS
Unstable optical resonator with cancelling edge waves
[AD-D011379] N85-16618

OPTICAL SCANNERS
Reduction of signal modulation caused by polarization in visible optical scanning systems
[AD-D011389] N85-16620

OPTICAL WAVEGUIDES
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851
Precision electrooptical deflector based on corrugated light guide N85-16020
Transformation of mode composition of circular optical waveguide N85-16023

OPTICS
Theory and applications of two-photon quantum optics
[AD-A147382] N85-16631

OPTIMIZATION
An improved computer model for prediction of axial gas turbine performance losses
[NASA-CR-174248] N85-15724
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
Charge domain filters for enhanced monolithic signal processing
[AD-A147428] N85-15964
Analysis of effectiveness of partial optimization of spatial processing systems N85-16031
Reduction method for thermal analysis of complex aerospace structures
[NASA-TP-2373] N85-16066
Continuity of the null space basis and constrained optimization
[AD-A147036] N85-16538
Trust region methods for minimization
[AD-A147073] N85-16540
Some applications of penalty functions in mathematical programming
[AD-A147443] N85-16552
Structural optimization and other large-scale processes
[AD-A147895] N85-16564
Pari-mutuel as a system of aggregation of information
[AD-A147210] N85-16570
Principles of multiobjective optimization
[AD-A147520] N85-16679
Efficient computation of optimal time for transaction processing in a database system
[AD-A147568] N85-16693

ORBITAL SPACE STATIONS
Engineering model system study for a regenerative fuel cell: Study report
[NASA-CR-174801] N85-16292

ORBITING LUNAR STATIONS
Concept and cost analysis of an orbiting lunar station
[ILF-MITT-138] N85-15776

OREGON
Image variance and spatial structure in remotely sensed scenes --- South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265

ORGANIC CHEMISTRY
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819

ORGANIC SILICON COMPOUNDS
Structural and synthetic organosilicon chemistry
[AD-A147101] N85-15820

ORGANIZING
Model of team organization and behavior and team description method
[AD-A147540] N85-16680

ORION NEBULA
Water maser outburst N85-16720

ORTHOTROPIC PLATES
Stresses in pin-loaded orthotropic plates using photoelasticity
[NASA-CR-172498] N85-16204

OSCILLATING CYLINDERS
Some important problems in unsteady boundary layers including separation. 1: Nature of singularity on oscillating airfoils
[AD-A147897] N85-16087

OSCILLATING FLOW
Float zone experiments in space
[NASA-CR-171284] N85-15766

OSCILLATIONS
Studies of the wall shear stress in a turbulent pulsating pipe flow
[AD-A146772] N85-16068

OSCILLATORS
Transmission line biased coherent array of Josephson oscillators
[AD-D011323] N85-15979
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010
New construction principles for oscillator power summing devices N85-16018
Silent discharge carbon dioxide gas laser machining facility
[BLL-CTO-2267-(9091.9F)] N85-16150
Passive maser using timesharing for control of the cavity and control of the oscillator on the line of stimulated emission
[AD-D011326] N85-16151
Phased locked array laser systems
[AD-D011317] N85-16164

OUTPUT
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404

OXIDATION
Corrosion study on zirconium refractory coatings. 1: Oxidation of zirconium nitrids coatings by oxygen
[BLL-RISLEY-TR-5044-(9091.9F)] N85-15857
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272
Biochemical evaluation of bodily influence of high and low temperatures N85-16441

OXIDATION RESISTANCE
Oxidation resistance of silicon ceramics
[NASA-TM-77429] N85-15898

OXIDATION-REDUCTION REACTIONS
Catalytic oxidation by transition metal ions in zeolites
[AD-A146626] N85-15842
OXYGEN
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
OXYGEN PLASMA
SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas
[AD-A147526] N85-16641
OXYGEN TENSION
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
OXYGENATION
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439
OXYHALIDES
High capacity inorganic oxyhalide electrochemical cell
[AD-D011321] N85-15845
OXYHEMOGLOBIN
Liposome-encapsulated hemoglobin for emergency resuscitation
[AD-A146794] N85-16446

P

P-N JUNCTIONS
An asymptotic analysis of a transient p-n junction model
[AD-A147270] N85-16004
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046
P-TYPE SEMICONDUCTORS
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914
P-3 AIRCRAFT
An analysis of constraints to coordinated tactical crew interaction in the P-3C aircraft
[AD-A147220] N85-16478
PACIFIC OCEAN
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
Oceanographic data for development of the US exclusive economic zone
[PB85-106458/GAR] N85-16415
PANELS
Design procedures for fiber composite structural components: Panels subjected to combined in-plane loads
[NASA-TM-86909] N85-15823
PARABOLIC ANTENNAS
Dual offset reflector antenna systems with rotationally symmetric aperture distributions
[AD-A147346] N85-15961
Efficient computation of reflector antenna aperture distributions and far field patterns
[AD-A147367] N85-15962
PARABOLIC REFLECTORS
Efficient computation of reflector antenna aperture distributions and far field patterns
[AD-A147367] N85-15962
PARACHUTE DESCENT
Parachute expedition to Arctic N85-16240
PARALLEL COMPUTERS
Solution of partial differential equations on vector and parallel computers
[NASA-CR-172500] N85-16525
PARALLEL PROCESSING (COMPUTERS)
Parallel processor configuration for adaptive antenna arrays
[AD-D011347] N85-15970
Future database machine architectures
[AD-A146786] N85-16481
Implementation of a constraint machine for prism - A parallel problem solver
[AD-A147844] N85-16512
What a parallel programming language has to let you say
[AD-A147854] N85-16513
Sequential and parallel matrix computations
[AD-A147871] N85-16562
PARALLEL PROGRAMMING
What a parallel programming language has to let you say
[AD-A147854] N85-16513
PARAMETER IDENTIFICATION
Aeroelastic analysis and the identification of flight loads — Mirage 2000 aircraft N85-15679
More than you want to know about maximum likelihood estimation
[NASA-TM-85905] N85-15752
Estimating location parameters in a mixture N85-16252
Bayesian estimation of normal mixture parameters N85-16255
Snow characterization measurements from SNOW-TWO/Smoke Week 6
[AD-A147423] N85-16402
PARAMETERIZATION
The effects of long-periodic forcing in a zero-dimensional climate model N85-16363
Development of a mixed scanning interactive system for decision support
[AD-A146895] N85-16670
PARTIAL DIFFERENTIAL EQUATIONS
Viscosity solutions of Hamilton-Jacobi equations at the boundary
[AD-A147444] N85-16553
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147463] N85-16554
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560
PARTICLE COLLISIONS
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields
[AD-A146854] N85-16602
PARTICLE ENERGY
Calculation of energy of atomization in silicate tetrahedron Si4(4-)
[BLL-M-36000-(5828.4)] N85-16599
PARTICLE INTERACTIONS
Calculation of energy of atomization in silicate tetrahedron Si4(4-)
[BLL-M-36000-(5828.4)] N85-16599
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields
[AD-A146854] N85-16602
PARTICLE MOTION
Earth's radiation belts
[AD-A147927] N85-16339
PATHOGENESIS
Pathogeneels and treatment of cerebral air embolism and associated disorders
[AD-A146723] N85-16443
PATTERN RECOGNITION
Proceedings of the Second Annual Symposium on Mathematical Pattern Recognition and Image Analysis Program
[E85-10056] N85-16251
Multivariate spline methods in surface fitting N85-16257
Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260
Power spectral ensity of markov texture fields N85-16262
Rectification of single and multiple frames of satellite scanner imagery using points and edges as control N85-16263
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Image-to-image correspondence: Linear structure matching N85-16266
Analysis of subpixel registration N85-16267
An automatic pattern recognition apparatus
[AD-D011319] N85-16628
Rule-based evidence accrual system for image understanding
[AD-A147835] N85-16634
PATTERN REGISTRATION
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
Analysis of subpixel registration N85-16267
PAVEMENTS
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
PAYLOAD CONTROL
Commerce Laboratory: Mission analysis payload integration study
[NASA-CR-171296] N85-15764
PAYLOAD INTEGRATION PLAN
Commerce Laboratory: Mission analysis payload integration study
[NASA-CR-171296] N85-15764
PAYLOADS
On-orbit support of DARPA-301 payload
[AD-A146897] N85-15767
PEAT
Versatility of peat emphasized N85-16316
PENALTY FUNCTION
Some applications of penalty functions in mathematical programming
[AD-A147443] N85-16552
PERFORATED PLATES
Stresses in pin-loaded orthotropic plates using photoelasticity
[NASA-CR-172498] N85-16204
PERFORMANCE PREDICTION
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints — aircraft structures
[LBF-FB-172/84] N85-16219
What should DOE do to help establish voluntary consensus standards for measuring and rating the performance of PV modules?
[NASA-CR-174265] N85-16297
Technical performance measurement handbook
[AD-A147314] N85-16675
PERFORMANCE TESTS
Qualification of an electrothermal hydrazine thruster with a vacuum thrust of 0.5 to 2.0 N
[BMFT-FB-W-84-043] N85-15808
Special problems of Ramjet with solid fuel N85-15815
Bearing tester fit analysis
[NASA-CR-171282] N85-16181
Demonstration of transparent solar array module design
[NASA-CR-174257] N85-16302
Evaluation of the measured energy performance of four solar systems
[AD-A147912] N85-16306
Comparative investigation of three commercial radiosonde systems
[KNMI-TR-53] N85-16409
PERIDOTITE
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272
PERIODIC FUNCTIONS
An analytical model of periodic waves in shallow water
[AD-A147501] N85-16085
An analytical model of periodic waves in shallow water
[AD-A147502] N85-16086
PERIODIC VARIATIONS
Microseism level, time variations at Turkmen seismic stations studied N85-16231
The effects of long-periodic forcing in a zero-dimensional climate model N85-16363
PERMAFROST
Pulse transmission through frozen silt
[AD-A147108] N85-15958
PERMEABILITY
Influence of size grading of sintering ore on the sintering process
[BLL-M-36004-(5828.4)] N85-15854
PERMITTIVITY
A quasi-optical method for measuring the complex permittivity of materials
[AD-A147483] N85-15966
PEROXIDES
Evaluation of the alkaline peroxide pre-bond surface treatment for titanium
[AD-A147352] N85-15881
PERSONAL COMPUTERS
Possibilities and impossibilities of microcomputer systems
[AD-1964-904] N85-16522
PERSONNEL
An analysis of the technical training of enlisted minuteman missile maintenance personnel
[AD-A147078] N85-15775
Model of team organization and behavior and team description method
[AD-A147540] N85-16680
Project manager's handbook for special projects
[AD-A147913] N85-16683
PERSONNEL DEVELOPMENT
Nondestructive inspection: Improved capabilities of technicians
[AD-A147388] N85-16196
PERSONNEL MANAGEMENT
Performance evaluation of A-10 aircraft mainteance units and aircraft using constrained facet analysis
[AD-A146955] N85-15660
Interaction of human cognitive models and computer based models in supervisory control
[AD-A142547] N85-16474

PERTURBATION
Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16638
PERU
Climate and fisheries: A Peruvian case study N85-16373
The El Nino phenomenon and its agrometeorological implications N85-16382
PH FACTOR
A biological sensor for the detection of toxicants
[AD-D011304] N85-16141
PHARMACOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics
[AD-A146851] N85-16423
PHASE CONTROL
Determination of row-and-column control principle of phase antenna array from amplitude-phase distribution of field in aperture N85-16033
PHASE LOCKED SYSTEMS
Transmission line biased coherent array of Josephson oscillators
[AD-D011323] N85-15979
Phased locked array laser systems
[AD-D011317] N85-16164
PHASE MODULATION
Micro-waveguide transformers of coherent optical signals N85-16022
PHASE SHIFT KEYING
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
PHASE TRANSFORMATIONS
Reciprocal solubility of phases in multi-component systems
[BLL-M-36003-(5828.4)] N85-15870
A study of structural phase transitions using light scattering techniques
[AD-A147261] N85-16654
PHASED ARRAYS
MMIC devices for active phased array antennas
[NASA-CR-174281] N85-15943
Determination of row-and-column control principle of phase antenna array from amplitude-phase distribution of field in aperture N85-16033
Short period guided waves over oceanic and continental paths
[AD-A147053] N85-16331
PHILOSOPHY
Outer space law: A problem of astronautics
[NASA-TM-77760] N85-16697
PHOSPHAZENE
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902
New synthesis of phosphazene polymers
[AD-A147567] N85-15910
PHOSPHINES
New synthesis of phosphazene polymers
[AD-A147567] N85-15910
PHOSPHORIC ACID FUEL CELLS
Gas cooled fuel cell systems technology development
[NASA-CR-174732] N85-16291
PHOSPHORS
Research on electroluminescence in thin film yttrium oxysulfide
[AD-A146909] N85-16582
PHOTOACOUSTIC SPECTROSCOPY
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15848
PHOTOCHEMICAL REACTIONS
Production of hydrogen by cyanobacteria
[PB85-113421/GAR] N85-15925
Photochemistry and kinetics of the O*2-HI system
[AD-A147433] N85-16167
Variation in photosynthesis with light level for model with two photochemical reactions N85-16430
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
PHOTOCONDUCTIVITY
Real-time analysis of space characteristics of microwave electromagnetic pulse fields by means of controllable layer structures N85-16052
PHOTOELASTICITY
CFM 56-2. Oligocyclic fatigue of the turbofan disk: Dimensionning and tests for verification and improvements N85-15750
Stresses in pin-loaded orthotropic plates using photoelasticity
[NASA-CR-172498] N85-16204
PHOTOELECTRON SPECTROSCOPY
Electron spectrometry experiments with the use of synchrotron radiation
[DE85-001286] N85-16610
PHOTOGRAPHIC EMULSIONS
Astronomical photography 1984 — conferences
[ROE-OR-14] N85-16102
A spectrosensitometer with an absolute calibration N85-16106
Comparison of the fine grain compensation hypersensitization (FAH) process with gas hypersensitizing techniques — astronomical photography plates N85-16107
The results of hydrogen hypersensitization of photoemulsions — astronomical photography N85-16108
The most effective astronomical photographic emulsions for recording of faint and low-contrast objects N85-16110
Astronomical applications of new infrared films N85-16111
The 3a-F emulsion and the quasar redshift cut-off N85-16112
Microspots on spectroscopic plates — astronomical photography N85-16113
Where to next in astronomical photography? — tabular grain emulsions N85-16114
What do we want: Increased speed, resolution, contrast or DQE? — astronomical photography N85-16115
The Malin effect in stellar photography N85-16131
PHOTOGRAPHIC FILM
The calibration of photographic and spectroscopic films: A densitometric analysis of IIaO film flown aboard the Space Shuttle 3
[NASA-CR-174278] N85-16101
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment — X-ray films N85-16104
Astronomical applications of new infrared films N85-16111
Infrared presensitization photography
[AD-A146968] N85-16139
PHOTOGRAPHIC PLATES
SENSIT.FOR: A program for sensitometric reduction N85-16105
Nitrogen flushing during exposure of large Schmidt telescope plates N85-16109
Microspots on spectroscopic plates — astronomical photography N85-16113
Using a Gossen light meter to produce enlarged interpositive film copies from glass plates — astronomical photography N85-16118
Processing of photographic observing material at the National Astronomical Observatory Rozhen N85-16120
The UK Schmidt telescope and the facilities in Edinburgh N85-16121
An investigation into the fidelity of reproduction of UKST original objective prism plates on to film — United Kingdom Schmidt Telescope (UKST) N85-16123
Extending magnitude standards to faint stars with a sub-beam prism N85-16124
Astronomers' problems with the calibration of Schmidt plates N85-16126
Power spectrum analysis of astronomical photographs digitised with small apertures N85-16127
Plate measurements and reductions at Muenster — astronomical photography N85-16129
The Malin effect in stellar photography N85-16131
Stellar photographic photometry using a double wedge technique with a focal reducer system N85-16133
Spectrophotometry of cool stars from objective prism spectra N85-16134
PHOTOGRAPHIC PROCESSING
Comparison of the fine grain compensation hypersensitization (FAH) process with gas hypersensitizing techniques — astronomical photography plates N85-16107
The results of hydrogen hypersensitization of photoemulsions — astronomical photography N85-16108
Nitrogen flushing during exposure of large Schmidt telescope plates N85-16109
Some aspects of photography with a small Schmidt camera — astronomical photography N85-16116
Using a Gossen light meter to produce enlarged interpositive film copies from glass plates — astronomical photography N85-16118
Unsharp masking at the enlarger — astronomical photography N85-16119
Processing of photographic observing material at the National Astronomical Observatory Rozhen N85-16120
The work of the photolabs at the Royal Observatory, Edinburgh — astronomical photography N85-16122
PHOTOGRAPHIC PROCESSING EQUIPMENT
Processing of photographic observing material at the National Astronomical Observatory Rozhen N85-16120
The work of the photolabs at the Royal Observatory, Edinburgh — astronomical photography N85-16122
PHOTOINTERPRETATION
Integrated analysis of remote sensing products from basic geological surveys — Brazil
[E85-10052] N85-16248
Evidence accumulation for spatial reasoning N85-16261
Forest area estimates from LANDSAT MSS and forest inventory plot data
[PB85-105617/GAR] N85-16290
PHOTOMASKS
Unsharp masking at the enlarger — astronomical photography N85-16119
PHOTOMETERS
Apparatus for determining the liquid water content of a gas
[AD-D011297] N85-15839
Using a Gossen light meter to produce enlarged interpositive film copies from glass plates — astronomical photography N85-16118
PHOTONS
Theory and applications of two-photon quantum optics
[AD-A147382] N85-16831
PHOTOSENSITIVITY
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment — X-ray films N85-16104
Comparison of the fine grain compensation hypersensitization (FAH) process with gas hypersensitizing techniques — astronomical photography plates N85-16107
PHOTOSYNTHESIS
Spectral estimators of absorbed photosynthetically active radiation in corn canopies
[E85-10041] N85-16242
Variation in photosynthesis with light level for model with two photochemical reactions N85-16430
PHOTOVOLTAIC CELLS
Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings
[NASA-CR-174274] N85-16296
What should DOE do to help establish voluntary consensus standards for measuring and rating the performance of PV modules?
[NASA-CR-174265] N85-16297
Microcomputer control of a residential photovoltaic power conditioning system
[DE84-014774] N85-16488
PHOTOVOLTAIC CONVERSION
Solar energy conversion based on the principle of fluorescent collectors. Installation of a test collector to deliver several Watts power
[BMFT-FB-T-84-192] N85-16308
Solar energy conversion based on the principle of fluorescent collectors
[BMFT-FB-T-84-193] N85-16309
PHOTOVOLTAIC EFFECT
What should DOE do to help establish voluntary consensus standards for measuring and rating the performance of PV modules?
[NASA-CR-174265] N85-16297
PHTHALOCYANIN
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory
[AD-A147161] N85-15844
PHYSICAL EXERCISE
A machine for weight-lift testing
[AD-A146816] N85-16182
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
PHYSICAL FITNESS
A machine for weight-lift testing
[AD-A146816] N85-16182
Human factors and training research in military organizations and systems
[AD-A146832] N85-16475
PHYSIOLOGICAL EFFECTS
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439
Testing changes in visual function due to orbital environment
[AD-A147259] N85-16453
PHYSIOLOGICAL RESPONSES
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
Carotid baroreceptor influences on peripheral circulatory and thermal responses during cold exposure
[AD-A146808] N85-16447

Neuro-linguistic programming: Eye movements as indicators of representational systems
[AD-A147541] N85-16454
PIEZOELECTRIC CRYSTALS
Microwave resonator using lateral excitation
[AD-D011374] N85-16596
PIEZOELECTRIC TRANSDUCERS
Optimization piezoelectric transducer width of acousto-optical devices N85-16024
Lightweight, broadband Rayleigh wave transducer
[AD-D011345] N85-16584
PIEZOELECTRICITY
Laser generation of ultrasonic waveform reconstructions
[AD-D011314] N85-16003
Switchable zero order diffraction gratings as light valves
[AD-A147575] N85-16633
PIGMENTS
Process for preparation of crosslinked poly(tri-n-butyltin) methacrylate with simultaneous particle size reduction
[AD-D011313] N85-15905
PILOT PERFORMANCE
Mental status in relation to special conditions of activity N85-16420
Job and family stress as predictors of pilot health, job satisfaction and performance
[AD-A142176] N85-16464
Practice makes perfect
[AD-A147124] N85-16466
PILOT TRAINING
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
PILOTS (PERSONNEL)
Human factors survey: C-5 pilots
[AD-A147106] N85-16477
PIONS
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606
PIPE FLOW
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701
Studies of the wall shear stress in a turbulent pulsating pipe flow
[AD-A146772] N85-16068
PIPELINING (COMPUTERS)
Solution of partial differential equations on vector and parallel computers
[NASA-CR-172500] N85-16525
PIPES (TUBES)
Identification of leaks: Internal acoustic method, phase 2
[PB85-101947/GAR] N85-15927
Studies of the wall shear stress in a turbulent pulsating pipe flow
[AD-A146772] N85-16068
Heat transfer due to film condensation on vertical fluted tubes
[AD-A147258] N85-16079
Method for non contacting gauging of the wall thickness of tubes by backscattering radiation
[OEFZS-4274] N85-16144
Improvement of gas-tightness of OTTG and TBO-5 threaded pipe couplings
[BLL-M-35993-(5828.4)] N85-16175
Damping capacity of multilayer tube during torsion
[BLL-M-36011-(5828.4)] N85-16202
PISTON ENGINES
Some characteristics of automotive gasolines and their performance in a light aircraft engine
[FAA-CT-84-12] N85-15919
PLANE STRAIN
Fundamentals of microcrack nucleation mechanics
[NASA-CR-3851] N85-16195
PLANE WAVES
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072
PLANETARY GRAVITATION
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095
PLANETARY WAVES
Interactions between mean flow and finite-amplitude mesoscale eddies in a barotropic ocean
[AD-A147249] N85-16413
PLANETS
Astrometric applications of the Mt. Stromlo PDS 1010A — microdensitometer N85-16136
PLANNING
The Air Force can improve its forecasts of aircraft spare parts requirements
[AD-A147911] N85-16682
PLANTS (BOTANY)
Controlled ecological life support system higher plant flight experiments
[NASA-CR-177323] N85-16471
PLASMA ACCELERATORS
Explosive emission cathode plasmas in intensive relativistic electron beam diodes
[AD-A147917] N85-16642
PLASMA CLOUDS
The role of finite parallel length on the stability of barium clouds
[AD-A146972] N85-16328
PLASMA CONTROL
A propagator expansion method for solving linearized plasma kinetic equations with collisions
[AD-A147524] N85-16640
PLASMA CURRENTS
The anode mechanism of a thermal argon arc
[NASA-TM-77754] N85-15835
PLASMA DENSITY
Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16638
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174286] N85-16639
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643
PLASMA DIAGNOSTICS
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643
PLASMA DIFFUSION
Asymptotic behaviour of the plasma equation
[AD-A147242] N85-16549
PLASMA DIODES
Explosive emission cathode plasmas in intensive relativistic electron beam diodes
[AD-A147917] N85-16642
PLASMA DRIFT
The role of finite parallel length on the stability of barium clouds
[AD-A146972] N85-16328
Ionospheric turbulence: Interchange instabilities and chaotic fluid behavior
[AD-A147810] N85-16337
PLASMA FOCUS
Intense excitation source of blue-green laser
[AD-A147450] N85-16168
PLASMA INTERACTIONS
Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16638
The environment of active galactic nuclei N85-16712
PLASMA JETS
The discharge mechanism of the high-temperature arc
[NASA-TM-77794] N85-15837
Investigation of granules of molybdenum-base alloys obtained with pulsed discharges
[BLL-M-36012-(5828.4)] N85-15871
PLASMA OSCILLATIONS
Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16638
PLASMA PINCH
Intense excitation source of blue-green laser
[AD-A147450] N85-16168
High-power radiating plasma
[NASA-TM-77784] N85-16637
PLASMA PUMPING
High-power radiating plasma
[NASA-TM-77784] N85-16637
PLASMA RADIATION
High-power radiating plasma
[NASA-TM-77784] N85-16637
PLASMA SPECTRA
High-power radiating plasma
[NASA-TM-77784] N85-16637
PLASMAS (PHYSICS)
Slow surface magnetoplasma waves in oblique magnetic field N85-16034
Research relative to plasma transport across the magnetopause
[NASA-CR-174300] N85-16836
PLASTIC DEFORMATION
Use of coordinate functions to calculate deformation fields
[BLL-M-36010-(5828.4)] N85-16524
PLASTICS
Method for forming electromagnetic-wave-screening composite N85-15930
PLATINUM
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
PLOTTING
A program to produce standard shewhart control charts for the statistics X-bar and R or S, P, NP, C, or U
[AD-A146971] N85-16501
PLOT3D: An interactive graphics code for 3-dimensional plots
[AD-A147887] N85-16514
PODS (EXTERNAL STORES)
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949
POINTING CONTROL SYSTEMS
Pointing and control system design study for the space infrared telescope facility (SIRTF)
[NASA-CR-166612] N85-15795
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178
POISSON DENSITY FUNCTIONS
Limiting distributions of functionals of Markov chains
[AD-A147832] N85-16577
POLAR CAPS
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726
POLAR REGIONS
Region 1 birkeland currents from a global MHD simulation of the magnetosphere
[AD-A147435] N85-16335
Diurnal freeze-thaw frequencies in selected regions of the high latitudes
[AD-A147276] N85-16400
POLARIS MISSILES
Polaris guidance system
[AD-D011324] N85-15704
POLARIZATION (WAVES)
Intrinsic polarization basis of radar target observed by system employing diversity reception N85-16015
Reduction of signal modulation caused by polarization in visible optical scanning systems
[AD-D011389] N85-16620
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing
[AD-A146827] N85-16623
POLICIES
Issues and findings N85-15782
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system
[AD-A147121] N85-16673
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16694
POLITICS
Outer space law: A problem of astronautics
[NASA-TM-77760] N85-16697
POLLUTION TRANSPORT
NOx emissions near a heat pump with gas motor
[BLL-WH-782-(9091.9F)] N85-16319
Climate and water quality N85-16368
POLYCARBONATES
Properties of miscible polymer blends
[AD-A147090] N85-15903
POLYESTER RESINS
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754
Properties of miscible polymer blends
[AD-A147090] N85-15903
POLYESTERS
Synthesis and characterization of unique liquid crystalline block copolyesters. A proposal for a polymer research center at the Atlanta University
[AD-A147280] N85-15907
POLYIMIDE RESINS
Flame resistant fibrous materials development
[NASA-CR-167817] N85-15827
POLYIMIDES
Evaluation of colorless polyimide film for thermal control coating applications
[NASA-TM-86341] N85-15894
POLYMER CHEMISTRY
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902
Rubber-modified epoxies. 1: Cure, transitions, and morphology
[AD-A147377] N85-15908
POLYMER MATRIX COMPOSITES
Unidirectional fibers and polyurethane elastomer matrix based composites synthesis and properties
[NASA-TM-77501] N85-15826
POLYMER PHYSICS
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914

POLYMERIC FILMS
The replacement of precious metal thick film inks using conductive polymer technology. Phase 1: Feasibility study
[AD-A147614] N85-15913
POLYMERIZATION
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride
[AD-D011393] N85-15818
Gradient polymers
[AD-A146836] N85-15900
Synthesis and characterization of unique liquid crystalline block copolyesters. A proposal for a polymer research center at the Atlanta University
[AD-A147280] N85-15907
New synthesis of phosphazene polymers
[AD-A147567] N85-15910
POLYMERS
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride
[AD-D011393] N85-15818
Moisture absorbing anti-arcing coating and method for applying same
[AD-D011310] N85-15904
New synthesis of phosphazene polymers
[AD-A147567] N85-15910
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914
POLYMETHYL METHACRYLATE
Gradient polymers
[AD-A146836] N85-15900
POLYNOMIALS
Performance of the h, p and h-p versions of the finite element method
[AD-A146940] N85-16535
POLYPHENYL ETHER
Contact angle and surface tension measurements of a five-ring polyphenyl ether
[NASA-TM-86827] N85-15897
POLYURETHANE FOAM
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures
[PB85-100949/GAR] N85-15918
POLYURETHANE RESINS
Unidirectional fibers and polyurethane elastomer matrix based composites synthesis and properties
[NASA-TM-77501] N85-15826
POPULATION THEORY
On the power functions of test statistics in order restricted inference
[AD-A147126] N85-16566
POROUS MATERIALS
Fatigue strength of different sintered steels and design criteria for porous material (PM) parts
[LBF-FB-170/84] N85-15886
PORTS (OPENINGS)
Integral boost, heat protection, port covers and transition N85-15813
POSITIONING DEVICES (MACHINERY)
Multi-directional straddle-lift carrier
[AD-D011315] N85-16183
POSTURE
Establishment of posture and working movements of pilot in air crash enquiries N85-16417
POTENTIAL FLOW
Supersonic nonlinear potential analysis
[NASA-CR-172456] N85-15885
POTENTIAL THEORY
A comparative study of the nonuniqueness problem of the potential equation
[NASA-TP-2385] N85-15694
POWDER METALLURGY
Comparison between the properties of conventional wrought and powder metallurgical alloys for turbine disc applications N85-15739
Influence of temperatures of reactants on nature of product of solid-phase reactions
[BLL-M-36019-(5828.4)] N85-15832
Influence of pressure on compaction during compression of powders of iron and 40Kh and 10R6M5 steels
[BLL-M-35995-(5828.4)] N85-15866
Investigation of granules of molybdenum-base alloys obtained with pulsed discharges
[BLL-M-36012-(5828.4)] N85-15871
Solid-phase sintering of tantalum carbide
[BLL-M-36013-(5828.4)] N85-15872
Fatigue strength of different sintered steels and design criteria for porous material (PM) parts
[LBF-FB-170/84] N85-15886
POWER AMPLIFIERS
Dual-gate MESFET variable gain constant output power amplifier
[AD-D011334] N85-15962
POWER CONDITIONING
Microcomputer control of a residential photovoltaic power conditioning system
[DE84-014774] N85-16488
POWER LINES
The ac power line protection for an IEEE 587 Class B environment N85-16347
POWER PLANTS
Combustion chamber floatwall panel attachment arrangement
[AD-D011358] N85-16647
POWER SPECTRA
Power spectrum analysis of astronomical photographs digitised with small apertures N85-16127
Power spectral ensity of markov texture fields N85-16262
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174286] N85-16639
PRANDTL NUMBER
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078
PRECAMBRIAN PERIOD
Synthesis of proterozoic data as a prerequisite for tectonic and thermal modeling
[NASA-CR-174252] N85-16323
PRECIPITATION (CHEMISTRY)
Clusters of defects in semiconductors
[AD-A147426] N85-16655
PRECIPITATION (METEOROLOGY)
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F
[AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F
[AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F
[AD-A146915] N85-16386
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F
[AD-A146918] N85-16389
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Louisiana, parts A-F
[AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea
[AD-A147204] N85-16397
Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16398
Revised Uniform Summary of Surface Weather Observations (RUSSWO). O'Hare International Airport, Chicago, parts A-F
[AD-A147206] N85-16399
PRECISION
Power of deterministic thinking in machine tool accuracy
[DE85-001751] N85-16188
PREDICTION ANALYSIS TECHNIQUES
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
View of future requirements for engine cyclic durability by analysis and testing N85-15751
Exploring the use of structural models to improve remote sensing agricultural estimates N85-16259
Evidence accumulation for spatial reasoning N85-16261
An evaluation of an advection fog prediction model
[AD-A147436] N85-16403
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
Robust prediction and interpolation for vector stationary processes, part 3
[AD-A147860] N85-16579
PREDICTIONS
General model of earthquakes and the place of warnings in it N85-16232
The problem of climate and climate variation N85-16353
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
PREPROCESSING
Adaptive preprocessing system
[AD-D011327] N85-15935
PRESSING (FORMING)
Making high explosive bodies for shaped charges by casting or pressing. Shaped charge research at Research Institute of National Defence (FOA) in 1972 - 1983, part 1
[FOA-C-20554-D4-PT-1] N85-15923
PRESSURE
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590
PRESSURE DEPENDENCE
A hydrogen partitioning model for hydrogen assisted crack growth
[AD-A147385] N85-16214
PRESSURE DISTRIBUTION
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15899
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies
[AD-A146964] N85-16069
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590
PRESSURE EFFECTS
Vityaz specialists study human adaptability to ocean depths N85-16225
PRESSURE GAGES
Dynamic polymer pressure transducer with temperature compensation
[AD-D011373] N85-16142
PRESSURE MEASUREMENT
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade
[NASA-TM-86914] N85-15889
PRESSURE REDUCTION
Safe decompression schedules for caisson workers
[PB85-103612/GAR] N85-16463
PRESSURE SENSORS
Aero-optics experimental techniques
[AD-A146755] N85-16067
Dynamic polymer pressure transducer with temperature compensation
[AD-D011373] N85-16142
Ultrasound instrumentation for the 7 inch Mach seven tunnel
[NASA-CR-174277] N85-16586
PRINTED CIRCUITS
Diagnostic apparatus for radar pulse repetition frequency control circuit card
[AD-D011364] N85-15938
MMIC devices for active phased array antennas
[NASA-CR-174281] N85-15943
PRINTING
The electronic typesetting program programmer's manual
[AD-A147500] N85-16508
PRISMS
Extending magnitude standards to faint stars with a sub-beam prism N85-16124
Sub-beam prism used at the Bosscha Schmidt telescope N85-16125
Stellar photographic photometry using a double wedge technique with a focal reducer system N85-16133
Spectrophotometry of cool stars from objective prism spectra N85-16134
Interpreting geothermal anomalies by special points method N85-16238
PROBABILITY DENSITY FUNCTIONS
Multivariate spline methods in surface fitting N85-16257
Some scientific subroutines in LISP
[AD-A147889] N85-16515

PROBABILITY DISTRIBUTION FUNCTIONS
Spline methods for approximating quantile functions and generating random samples
[NASA-TP-2389] N85-16565
Pari-mutuel as a system of aggregation of information
[AD-A147210] N85-16570
PROBABILITY THEORY
Analysis of subpixel registration N85-16267
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
The symmetry group and exponents of operator stable probability measures
[AD-A147167] N85-16568
Ambiguity and uncertainty in probabilistic inference
[AD-A147378] N85-16572
Belief structures
[AD-A147526] N85-16575
The effect of assumptions about cost element probability distributions on operating and support cost risk analysis
[AD-A147553] N85-16576
Development of a mixed scanning interactive system for decision support
[AD-A146895] N85-16670
PROBLEM SOLVING
A method for solving the inverse problem of transonic cascade flow
[AD-A146739] N85-15696
Effects of individual mnemonic characteristics on problem solving N85-16419
Mental models and cooperative problem solving with expert systems
[AD-A147843] N85-16479
Research in applied mathematics, numerical analysis, and computer science
[NASA-CR-172505] N85-16480
Implementation of a constraint machine for prism - A parallel problem solver
[AD-A147844] N85-16512
Lattice statistics
[AD-A146862] N85-16530
Solution of finite element problems by preconditioned conjugate gradient and Lanczos methods
[AD-A146921] N85-16532
Viscosity solutions of Hamilton-Jacobi equations at the boundary
[AD-A147444] N85-16553
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147463] N85-16554
Sequential and parallel matrix computations
[AD-A147871] N85-16562
Development of a mixed scanning interactive system for decision support
[AD-A146895] N85-16670
On the complexity of distributed decision problems
[AD-A147174] N85-16674
Distributed knowledge base systems for diagnosis and information retrieval
[AD-A146890] N85-16690
PROCESS CONTROL (INDUSTRY)
Control technology for integrated circuit fabrication at Micro-Circuit Engineering, Incorporated, West Palm Beach, Florida
[PB85-100717/GAR] N85-16013
An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement
[AD-A147496] N85-16678
PROCUREMENT
An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement
[AD-A147496] N85-16678
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16694
PRODUCT DEVELOPMENT
What do we want: Increased speed, resolution, contrast or DOF? — astronomical photography N85-16115
Possibilities and impossibilities of microcomputer systems
[AD-1984-904] N85-16522
PRODUCTION
Fiat, Peugeot introduce integrated robotized engine: CAD used N85-15933
PRODUCTION COSTS
A buyer's guide to space infrastructure N85-15784
PRODUCTION ENGINEERING
Control technology for integrated circuit fabrication at Micro-Circuit Engineering, Incorporated, West Palm Beach, Florida
[PB85-100717/GAR] N85-16013
PRODUCTIVITY
The climate in food production in Latin America N85-16359
Contractor productivity measurement
[AD-A146756] N85-16666
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models
[AD-A147329] N85-16676
An appraisal of the USAF Technology Modernization Program
[AD-A147344] N85-16677
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681
PROGRAM VERIFICATION (COMPUTERS)
On the generation of random variables for radar simulation purposes N85-15947
Finite difference calculations of buoyant convection in an enclosure. Part 2: Verification of the nonlinear algorithm
[PB85-104065/GAR] N85-16089
Ada compiler validation summary report: New York University (NYU Ada/Ed) compiler, version 1.4 for VAX 11/780, using VMS 3.5
[AD-A146924] N85-16483
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a for Sun 120 Motorola M68010, using 4.2 BSD UNIX-Sun Version 1.1
[AD-A146925] N85-16484
Formal verification of mathematical software
[NASA-CR-172407] N85-16489
NYU Ada/Ed user's guide: Version 1.4 for VAX/VMS systems
[AD-A146759] N85-16495
Software test handbook
[AD-A146844] N85-16498
Functional semantics of modules
[AD-A146923] N85-16500
Debug testing and confidence testing
[AD-A147104] N85-16504
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a2 for Callan Unistar 300, using System V, version 4.1a
[AD-A147115] N85-16505
PROGRAMMING LANGUAGES
Control system design language implementation of a gas turbine starting controller
[AD-A147896] N85-15732
What a parallel programming language has to let you say
[AD-A147854] N85-16513
Some scientific subroutines in LISP
[AD-A147889] N85-16515
PROJECT MANAGEMENT
The management of research institutions: A look at government laboratories
[NASA-SP-481] N85-16665
PROJECTILES
A metallographic investigation of rotating bands for 7.5 cm artillery projectiles
[FOA-C-20551-D2] N85-15888
PROJECTS
Project manager's handbook for special projects
[AD-A147913] N85-16683
PROPAGATION MODES
Transformation of mode composition of circular optical waveguide N85-16023
PROPELLANT BINDERS
Combustion properties of fuel-rich magnesium propellants with HTPB as binder
[FOA-C-20555-D1] N85-15924
PROPELLANT COMBUSTION
Combustion properties of fuel-rich magnesium propellants with HTPB as binder
[FOA-C-20555-D1] N85-15924
PROPELLANTS
An optical and mass spectrometric study of the aluminum-oxygen flame
[AD-A147434] N85-15849
PROPULSION SYSTEM CONFIGURATIONS
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716
Ramjets with supersonic combustion N85-15817
PROPULSION SYSTEM PERFORMANCE
Study on control of ion engine system
[EL-847] N85-15800
PROPULSIVE EFFICIENCY
Design study of technology requirements for high performance single-propeller-driven business airplanes
[NASA-CR-3863] N85-15692
PROSTHETIC DEVICES
Metallic aid and technique in fitting voice prosthesis
[AD-D011356] N85-16442
PROTECTIVE CLOTHING
Windblast leg protector assembly
[AD-D011376] N85-15700
Flame-resistant materials for use in pyrotechnic safety clothing
[AD-A146857] N85-15901
PROTECTIVE COATINGS
Mechanical aspects of high temperature coatings N85-15749
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851
Process for preparation of crosslinked poly(tri-n-butyltin) methacrylate with simultaneous particle size reduction
[AD-D011313] N85-15905
PROTECTORS
Windblast leg protector assembly
[AD-D011376] N85-15700
PROTOSTARS
The relevance of QUASAT to the star formation problem N85-16718
PSYCHOLOGICAL FACTORS
Job and family stress as predictors of pilot health, job satisfaction and performance
[AD-A142176] N85-16464
A study of the relationship between user attitudes and the success of the MAJCOM and AFRCE work information management system
[AD-A146956] N85-16671
PSYCHOLOGICAL TESTS
Conjunctive and disjunctive item response functions
[AD-A147815] N85-16561
PSYCHOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
Ambiguity and uncertainty in probabilistic inference
[AD-A147378] N85-16572
PSYCHOMETRICS
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F
[AD-A147166] N85-16392
PSYCHOMOTOR PERFORMANCE
Speech-action interrelationships in operational work N85-16418
Random pattern tracking acceleration tolerance tester
[AD-D011404] N85-16459
PSYCHOPHYSIOLOGY
Effects of individual mnemonic characteristics on problem solving N85-16419
PUBLIC HEALTH
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
PULMONARY CIRCULATION
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439
PULSE CODE MODULATION
Pulse code modulation telemetry: Properties of various binary modulation types
[AD-A147214] N85-15780
PULSE DURATION MODULATION
Formation of radio signals with low out-of-band radiation N85-16018
PULSE POSITION MODULATION
Formation of radio signals with low out-of-band radiation N85-16018
PULSE RADAR
Reference oscillator stability effect on clutter cancellation in a radar system N85-15946
PULSED LASERS
Self-generated magnetic fields and thermal flux inhibition
[AD-A147405] N85-16166
Intense excitation source of blue-green laser
[AD-A147450] N85-16168
Pulsed electric discharge laser technology. Electron beam window foil material
[AD-A147488] N85-16171
PUMP IMPELLERS
Investigation of the HPFTP first stage impeller crack
[NASA-CR-171281] N85-16208
PURPOSES
Broadening the debate N85-15785

PYROLYSIS
Mechanism of soot formation
[AD-A146817] N85-15841
Silazane precursors to silicon nitride
[AD-A146791] N85-15899
PYROTECHNICS
Flame-resistant materials for use in pyrotechnic safety clothing
[AD-A146857] N85-15901

Q

QUADRATIC PROGRAMMING
A dual quadratic programming algorithm
[AD-A147237] N85-16547
QUADRUPOLES
Calculated parameters for the initial part of an accelerator with high-frequency quadrupole focusing
[RAE-TRANS-2122] N85-16600
QUALITY CONTROL
The effects of software quality control and baseline management on the acquisition of computer programs
[AD-A147051] N85-16502
A survey and evaluation of software quality assurance
[AD-A147552] N85-16510
An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement
[AD-A147496] N85-16578
QUANTILES
Spline methods for approximating quantile functions and generating random samples
[NASA-TP-2389] N85-16565
QUANTITATIVE ANALYSIS
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15846
QUANTUM CHEMISTRY
Application of quantum chemistry of atmospheric chemistry
[AD-A147035] N85-15843
QUANTUM ELECTRONICS
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
Solid state research
[NASA-CR-174285] N85-16656
QUANTUM THEORY
Theory and applications of two-photon quantum optics
[AD-A147982] N85-16631
QUARTZ
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010
QUASARS
The 3a-F emulsion and the quasar redshift cut-off N85-16112
QUENCHING (COOLING)
Study of residual stresses introduced into TA6ZrD (685) cylinders by quenching
[BLL-PNR-90240-(8019.3153)] N85-15859
QUEUEING THEORY
Omni transforms: Applications to renewal theory
[AD-A146939] N85-16534

R

RADAR
Radar frequency selection strategies
[AD-A147493] N85-15967
RADAR BEAMS
Radar echo enhancement using surface reflections
[AD-A146970] N85-15955
RADAR CROSS SECTIONS
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar
[NASA-TM-86167] N85-16273
RADAR DATA
Adaptive preprocessing system
[AD-D011327] N85-15935
On the generation of random variables for radar simulation purposes N85-15947
RADAR DETECTION
Radar frequency selection strategies
[AD-A147493] N85-15967
Intrinsic polarization basis of radar target observed by system employing diversity reception N85-16015
RADAR ECHOES
Radar echo enhancement using surface reflections
[AD-A146970] N85-15955
Design of an analog spectrum analyzer for probing experiments
[AD-A147384] N85-15963
RADAR EQUIPMENT
Diagnostic apparatus for radar pulse repetition frequency control circuit card
[AD-D011364] N85-15938
Tracking servo compensator with rate aiding
[AD-D011372] N85-15971
RADAR MEASUREMENT
Intermediate results of radar backscatter measurements from summer sea ice
[AD-A147212] N85-15960
Design of an analog spectrum analyzer for probing experiments
[AD-A147384] N85-15963
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar
[NASA-TM-86167] N85-16273
RADAR NAVIGATION
National airspace review: Airport radar service area operational confirmation report
[DOT/FAA/AT-84/2] N85-15707
RADAR RECEPTION
Intrinsic polarization basis of radar target observed by system employing diversity reception N85-16015
RADAR REFLECTORS
Data appendix: F-number = 1.0 EMR with a flexible back electrode
[NASA-CR-172477] N85-15994
RADAR RESOLUTION
Limitation of VLBI angular resolution N85-16710
RADAR SCATTERING
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar
[NASA-TM-86167] N85-16273
RADAR TARGETS
Intrinsic polarization basis of radar target observed by system employing diversity reception N85-16015
RADAR TRACKING
Tracking servo compensator with rate aiding
[AD-D011372] N85-15971
RADAR TRANSMISSION
Pulse transmission through frozen silt
[AD-A147108] N85-15958
RADIATION ABSORPTION
Spectral estimators of absorbed photosynthetically active radiation in corn canopies
[E85-10041] N85-16242
RADIATION BELTS
Earth's radiation belts
[AD-A147927] N85-16339
RADIATION COUNTERS
Comparison measurements on optical particle counters
[BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
RADIATION DAMAGE
Chemical protection against ionizing radiation
[AD-A147822] N85-16457
RADIATION DISTRIBUTION
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields
[AD-A146854] N85-16602
RADIATION DOSAGE
A total dose characterization of five commercial analog multiplexers
[AD-A146886] N85-15997
RADIATION EFFECTS
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773
A total dose characterization of five commercial analog multiplexers
[AD-A146886] N85-15997
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-027] N85-16426
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
Chemical protection against ionizing radiation
[AD-A147822] N85-16457
RADIATION HARDENING
Analytic models for radiation induced loss in optical fibers 2: A physical model
[AD-A147442] N85-16632
RADIATION HAZARDS
Assessment of radiation dosages obtained by intake of radioactive fallout contaminated food
[VTT-292] N85-16460
RADIATION PROTECTION
Method for forming electromagnetic-wave-screening composite N85-15930
RADIATION TOLERANCE
The relationship between radiation sensitivity and redox equilibria — glass processing variables
[AD-A147216] N85-15906
RADIATIVE HEAT TRANSFER
Methods for heat transfer and temperature field analysis of the insulated diesel
[NASA-CR-174783] N85-16699
RADIATIVE TRANSFER
Infrared emission and atomic transitions
[AD-A147840] N85-16607
RADIO ASTRONOMY
QUASAT: A VLBI observatory in space — conferences
[ESA-SP-213] N85-16700
Some prospects of space VLBI N85-16705
QUASAT: Technical aspects of the proposed mission — VLBI satellite N85-16706
The compact radio emission regions in active galactic nuclei — QUASAT VLBI mission N85-16713
Very Long Base Interferometry (VLBI) in space and X-ray observations of compact sources in active galactic nuclei N85-16716
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies — QUASAT N85-16723
RADIO EMISSION
The compact radio emission regions in active galactic nuclei — QUASAT VLBI mission N85-16713
RADIO FREQUENCIES
Transmission line biased coherent array of Josephson oscillators
[AD-D011323] N85-15979
RF laser array driver apparatus
[AD-D011375] N85-16155
Optical RF downconverter
[AD-D011336] N85-16616
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies — QUASAT N85-16723
RADIO FREQUENCY INTERFERENCE
Synoptic observations of the radio noise background in the frequency range 150-160 kHz to provide design data for the low frequency communications designer
[AD-A147438] N85-15965
RADIO GALAXIES
The environment of active galactic nuclei N85-16712
The compact radio emission regions in active galactic nuclei — QUASAT VLBI mission N85-16713
RADIO INTERFEROMETERS
The wide-range space radio interferometer N85-16717
RADIO SIGNALS
Formation of radio signals with low out-of-band radiation N85-16018
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
Arctic marine acoustics
[AD-A147482] N85-16594
RADIO SOURCES (ASTRONOMY)
Cosmology N85-16701
The QUASAT mission: An overview N85-16704
QUASAT: Technical aspects of the proposed mission — VLBI satellite N85-16706
A study on the imaging potential of QUASAT — spaceborne VLBI N85-16707
RADIO TELESCOPES
Research in geodesy based upon radio interferometric observations of extragalactic radio sources
[AD-A147581] N85-16280
RADIO TRANSMISSION
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-018] N85-16014
RADIO TRANSMITTERS
Estimation of requirements for acceptable noise radiation level of communication transmitters N85-16017
RADIO WAVE REFRACTION
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715
RADIO WAVES
Influence of Faraday effect in ionosphere on nonmutuality of meteor radio channel N85-16037
RADIOACTIVE ISOTOPES
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
RADIOBIOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
RADIOCHEMISTRY
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228

RADIOGRAPHY
Metallic sid and technique in fitting voice prosthesis [AD-D011356] N85-16442
Improved radiographic viewing system [AD-A147587] N85-16456
Ultrasonic measurements, X-ray photographs and image processing [BLL-RISLEY-TR-4586-(9091.9F)] N85-16583

RADIOLOGY
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment — X-ray films N85-16104

RADIOMETERS
NBS (National Bureau of Standards) switching radiometers [PB84-235894] N85-16147

RADIOMETRIC CORRECTION
Characterizing the scientific potential of satellite sensors — San Francisco, California [E85-10044] N85-16244
Characterizing the scientific potential of satellite sensors — San Francisco, California [E85-10053] N85-16249
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications [E85-10057] N85-16268

RADIOSONDES
C2 sub n (optical) studies in the free atmosphere based on rawinsonde data [AD-A147307] N85-16332
Comparative investigation of three commercial radiosonde systems [KNMI-TR-53] N85-16409

RADIOTELEPHONES
Estimation of requirements for acceptable noise radiation level of communication transmitters N85-16017

RADOMES
Tolerance synthesis of multilayer radome walls N85-16041

RAIN
The influence of sample collection and methods of analysis on chemical concentrations measured in rainwater [KNMI-TR-55] N85-15853
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar [NASA-TM-86167] N85-16273
Antiscaling technology: Theories of surface scaling and performance of antiscaling surface coatings [NASA-CR-174274] N85-16296

RAIN FORESTS
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica [E85-10051] N85-16247

RAIN GAGES
Rain rate meter [AD-D011381] N85-16342

RAMAN SPECTRA
Electronics research at the University of Texas at Austin [AD-A146900] N85-15998

RAMAN SPECTROSCOPY
A study of structural phase transitions using light scattering techniques [AD-A147261] N85-16654

RAMJET ENGINES
Ramjet and Ramrocket Propulsion Systems for Missiles [AGARD-LS-136] N85-15809
Ramjet and Ramrocket Propulsion Systems for Missiles: Introduction and overview N85-15810
Ramjet air induction system design for tactical missile application N85-15811
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812
Integral boost, heat protection, port covers and transition N85-15813
Liquid-fueled Ramjet engines N85-15814
Special problems of Ramjet with solid fuel N85-15815

RANDOM NUMBERS
On the generation of random variables for radar simulation purposes N85-15947

RANDOM SAMPLING
Spline methods for approximating quantile functions and generating random samples [NASA-TP-2389] N85-16565

RANDOM VARIABLES
Rivista Tecnica Selenia, volume 9, number 1 N85-15945
On the generation of random variables for radar simulation purposes N85-15947
On a random difference equation for matrices and a characterization of the gamma distribution [AD-A146858] N85-16529
Conditionally heteroscedastic autoregressions [AD-A147188] N85-16567
Generalized additive models [AD-A147454] N85-16573
Belief structures [AD-A147526] N85-16575

RANDOM VIBRATION
The Shock and Vibration Digest, volume 16, no. 9 [AD-A146779] N85-16200
Techniques for nonlinear random vibration problems N85-16201

RANGELANDS
An integrated remote sensing approach for identifying ecological range sites — parker mountain [E85-10050] N85-16246

RANKINE CYCLE
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program [PB85-100931/GAR] N85-15928

RATES (PER TIME)
Rain rate meter [AD-D011381] N85-16342
Snow characterization measurements from SNOW-TWO/Smoke Week 6 [AD-A147423] N85-16402

RATS
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics [AD-A146851] N85-16423

RAWINSONDES
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS) [NASA-TP-2425] N85-16351

RAY TRACING
Ocean acoustics [AD-A147062] N85-16591

RAYLEIGH SCATTERING
Ionospheric turbulence: Interchange instabilities and chaotic fluid behavior [AD-A147810] N85-16337

RAYLEIGH WAVES
Lightweight, broadband Rayleigh wave transducer [AD-D011345] N85-16584

RC CIRCUITS
The design of high order active RC-filters [DRIC-T-7147] N85-15987

REACTION KINETICS
Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods [NASA-TM-86923] N85-15726
Reactions of butadyne. 1: The reaction with hydrogen atoms [NASA-TM-77805] N85-15834
Interaction between chromium oxide and carbon [BLL-M-36002-(5828.4)] N85-15867
Solid-phase sintering of tantalum carbide [BLL-M-36013-(5828.4)] N85-15872
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase [BLL-M-36023-(5828.4)] N85-15873
Photochemistry and kinetics of the O*2-HI system [AD-A147433] N85-16167

REACTOR PHYSICS
The reactor dynamic code RETRANS: Structure and users guide [OEFZS-4287] N85-16614

REACTOR SAFETY
Acoustic transducers for fast reactor instrumentation [BLL-RISLEY-TR-4979-(9091.9F)] N85-16091
Austrian contributions to fuel rod failure models shown at the International Standard Problem (ISP)-14 [OEFZS-4276] N85-16613

READ-ONLY MEMORY DEVICES
Logic elements for systems with variable structure N85-16054

REAL TIME OPERATION
The Western Aeronautical Test Range of NASA Ames Research Center [NASA-TM-85924] N85-15756
Some characteristics of automotive gasolines and their performance in a light aircraft engine [FAA-CT-84-12] N85-15919
Real-time analysis of space characteristics of microwave electromagnetic pulse fields by means of controllable layer structures N85-16052
ILIR task of digital recoil travel measurement system [AD-A147102] N85-16140
Decentralized control of scheduling in distributed systems [AD-A147446] N85-16487
JPL Robotics Laboratory computer vision software library [NASA-CR-174272] N85-16491
Ada training curriculum. Real-time systems in Ada I401 teacher's guide, volume 1 [AD-A146782] N85-16496
Ada training curriculum. Real-time systems in Ada I401 teacher's guide, volume 2 [AD-A146783] N85-16497

RECEIVERS
Natural interference phenomena affecting spaceborne receivers [NASA-CR-174256] N85-15798
Hardwire missile receiver coupler [AD-D011350] N85-15936
Spaceborne receivers: Basic principles [NASA-CR-17 .269] N85-15990
Lightweight, broadband Rayleigh wave transducer [AD-D011345] N85-16584

RECIPROCITY THEOREM
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment — X-ray films N85-16104

RECOMBINATION COEFFICIENT
Ionic reactions of atmospheric importance [AD-A147354] N85-16333

RECONNAISSANCE
Modern signal processing and reconnaissance — conferences [FOA-C-30374-E1] N85-15975

RECONSTRUCTION
Surface reconstruction preserving discontinuities [AD-A146741] N85-16526

RECURSIVE FUNCTIONS
A note on using the integrated form of ARIMA forecasts [AD-A146965] N85-16536

RED SHIFT
The 3a-F emulsion and the quasar redshift cut-off N85-16112

REDUCED GRAVITY
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites [NASA-CR-171271] N85-15880

REDUCTION (CHEMISTRY)
Interaction between chromium oxide and carbon [BLL-M-36002-(5828.4)] N85-15867
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase [BLL-M-36023-(5828.4)] N85-15873

REENTRY VEHICLES
Erosion-resistant nosetip construction [AD-D011346] N85-15797

REFLECTANCE
Reflection theorems for some anisotropic media N85-16038
Determination of parameters of doped thin semiconductor layers from plasmatic minimum of reflection coefficient for infrared radiation N85-16047
Changes in spectral properties of detached leaves [E85-10042] N85-16243

REFLECTION
Radar echo enhancement using surface reflections [AD-A146970] N85-15955

REFLECTORS
Dual band, low sidelobe, high efficiency mirror antenna [AD-D011329] N85-15980

REFRACTION
Design and testing of a refractive laser beam homogenizer [AD-A146997] N85-16162

REFRACTIVITY
C2 sub n (optical) studies in the free atmosphere based on rawinsonde data [AD-A147307] N85-16332

REFRACTORY COATINGS
Corrosion study on zirconium refractory coatings. 1: Oxidation of zirconium nitride coatings by oxygen [BLL-RISLEY-TR-5044-(9091.9F)] N85-15857

REFRACTORY METALS
Method for making alloy additions to base metals having higher melting points [AD-D011403] N85-15884

REGENERATION (PHYSIOLOGY)
Problems associated with the utilization of algae in bioregenerative life support systems [NASA-CR-166615] N85-16469
Feasibility of producing a range of food products from a limited range of undifferentiated major food components [NASA-CR-177329] N85-16473

REGENERATIVE FUEL CELLS
Engineering model system study for a regenerative fuel cell: Study report [NASA-CR-174801] N85-16292

REGIONAL PLANNING
Climate Conference for Latin America and the Caribbean
[WMO-632] N85-16352
Climate applications: General N85-16355
The challenge of food production: The importance of climate N85-16361
The management of atmospheric resources in food production N85-16362
Requirements for training in climate-related subjects N85-16378

REGRESSION ANALYSIS
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
Exploring the use of structural models to improve remote sensing agricultural estimates N85-16259
Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
Some scientific subroutines in LISP
[AD-A147889] N85-16515
Estimation for a semimartingale regression model using the method of sieves
[AD-A146809] N85-16527
Conditional regression models for transient state survival analysis
[AD-A147872] N85-16563
Generalized additive models
[AD-A147454] N85-16573
Infinite order autoregressive representations of multivariate stationary stochastic processes
[AD-A147863] N85-16580

REINFORCED PLASTICS
Impressions from a study tour in Finland concerning fiber reinforced plastics, June 1984
[FOA-C-20552-D2(E4,F9)] N85-15831

REINFORCED SHELLS
Finite element procedures applicable to nonlinear analysis of reinforced concrete shell structures
[AD-A146796] N85-16209

REINFORCING FIBERS
Impressions from a study tour in Finland concerning fiber reinforced plastics, June 1984
[FOA-C-20552-D2(E4,F9)] N85-15831

REINFORCING MATERIALS
Ultrasonic analysis of spherical composite test specimens
[DE85-001591] N85-16197

RELATIVISTIC ELECTRON BEAMS
Explosive emission cathode plasmas in intensive relativistic electron beam diodes
[AD-A147917] N85-16642

RELATIVISTIC PLASMAS
The environment of active galactic nuclei N85-16712

RELATIVISTIC VELOCITY
Testing theories of superluminal motion — QUASAT N85-16714

RELAXATION (MECHANICS)
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium
[AD-A147888] N85-15915

RELIABILITY
More than you want to know about maximum likelihood estimation
[NASA-TM-85905] N85-15752
The theory of optimal confidence limits for systems reliability with counterexamples for results on optimal confidence limits for series systems
[AD-A147236] N85-16546

RELIABILITY ANALYSIS
Reliability analysis of local area networks, intermediate report
[BLL-WH-610-(9001.9F)] N85-16520

RELIABILITY ENGINEERING
Design and test requirements for development of today's engines N85-15737
Nondestructive inspection: Improved capabilities of technicians
[AD-A147388] N85-16196

REMOTE CONTROL
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators
[NAS-MD-790] N85-15705

REMOTE REGIONS
Project manager's handbook for special projects
[AD-A147913] N85-16683

REMOTE SENSING
Upper Atmosphere Research Satellite (UARS) trade analysis
[NASA-CR-175269] N85-15774
Intermediate results of radar backscatter measurements from summer sea ice
[AD-A147212] N85-15960
Power transfer from natural emitters to collection apertures at microwave wavelengths
[NASA-CR-174275] N85-15969
Stereo Electro-optical Tracking System (SETS)
[NASA-CR-172471] N85-16098
Enhancement of multispectral scanner images by digital filtering
[ESA-TT-824] N85-16284
Remote sensing of atmospheric gases with CO2 lasers. Continuation and conclusion of spectroscopic investigations
[BMFT-FB-W-84-030] N85-16285
Remote sensing of the high latitude ionosphere
[AD-A147881] N85-16405

REMOTE SENSORS
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5
[E85-10059] N85-16270
Thematic Mapper. Volume 2: Flight model preshipment review
[E85-10060] N85-16271

RENE 95
Comparison between the properties of conventional wrought and powder metallurgical alloys for turbine disc applications N85-15739

REPLACING
The replacement of precious metal thick film inks using conductive polymer technology. Phase 1: Feasibility study
[AD-A147814] N85-15913

REPRODUCTION (COPYING)
An investigation into the fidelity of reproduction of UKST original objective prism plates on to film — United Kingdom Schmidt Telescope (UKST) N85-16123

REQUIREMENTS
View of future requirements for engine cyclic durability by analysis and testing N85-15751
Estimating wartime support resource requirements. Statistical and related policy issues
[AD-A147923] N85-16685

RESEARCH AND DEVELOPMENT
The management of research institutions: A look at government laboratories
[NASA-SP-481] N85-16665
Organizations and information processing: A field study of research and development units within the United States Air Force Systems Command
[AD-A147381] N85-16691
Research and technology, 1984 report
[NASA-TM-83096] N85-16730

RESEARCH FACILITIES
Upper Atmosphere Research Satellite (UARS) trade analysis
[NASA-CR-175269] N85-15774
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
The management of research institutions: A look at government laboratories
[NASA-SP-481] N85-16665

RESEARCH MANAGEMENT
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718
Evaluation of the musculoskeletal diseases program
[PB84-230648] N85-16481
Organizations and information processing: A field study of research and development units within the United States Air Force Systems Command
[AD-A147381] N85-16691

RESEARCH PROJECTS
Lightning research: A user's lament N85-16346

RESIDENTIAL ENERGY
Microcomputer control of a residential photovoltaic power conditioning system
[DE84-014774] N85-16488

RESIDUAL STRESS
Study of residual stresses introduced into TA6ZrD (685) cylinders by quenching
[BLL-PNR-90240-(8019.3153)] N85-15859
Residual stresses at small diffusion welds
[DE84-014962] N85-16189
Nondestructive measurement of bulk residual stresses
[AD-A147063] N85-16211
In-situ stress determination in soil and rock using the acoustic emission method
[AD-A147459] N85-16215

RESIN MATRIX COMPOSITES
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754

RESINS
Moisture absorbing anti-arcing coating and method for applying same
[AD-D011310] N85-15904

RESOLUTION
An operator method for computing the asymptotics of a collision resolution interval
[AD-A146837] N85-16528

RESONATORS
Reverse wave suppression in unstable ring resonator
[AD-A146825] N85-15952
Low noise multiple crystal-controlled oscillator
[AD-D011401] N85-16010
Microwave resonator using lateral excitation
[AD-D011374] N85-16596

RESOURCE ALLOCATION
Control and modeling of a CELSS (Controlled Ecological Life Support System)
[NASA-CR-177324] N85-16472

RESOURCES MANAGEMENT
Climate Conference for Latin America and the Caribbean
[WMO-632] N85-16352
The management of atmospheric resources in food production N85-16362
Evaluation of the climatic resources of Cuba applied to agricultural work N85-16380
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146808] N85-16667
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models
[AD-A147329] N85-16676
Estimating wartime support resource requirements. Statistical and related policy issues
[AD-A147923] N85-16685

RESPIRATORY PHYSIOLOGY
Short-term human respiratory effects of nitrogen dioxide: Determination of quantitative dose-response profiles. Phase 2: Exposure of asthmatic volunteers to 4 PPM NO2
[PB85-104388/GAR] N85-16482

RESPONSES
Conjunctive and disjunctive item response functions
[AD-A147815] N85-16561

RESUSCITATION
Liposome-encapsulated hemoglobin for emergency resuscitation
[AD-A146794] N85-16446

RETRACTABLE EQUIPMENT
Electronic module insertion and retraction mechanism
[AD-D011309] N85-16002

REVENUE
Financing considerations and Federal budget impacts N85-15792

REVISIONS
United States Air force aircraft modification process: A system dynamics analysis
[AD-A146954] N85-15659

REYNOLDS NUMBER
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078

RHEOMETERS
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433

RING CURRENTS
Earth's radiation belts
[AD-A147927] N85-16339

RISK
Conditional regression models for transient state survival analysis
[AD-A147872] N85-16563
Ambiguity and uncertainty in probabilistic inference
[AD-A147378] N85-16572

RIVERS
Image-to-image correspondence: Linear structure matching N85-16266
Forecasting water temperature decline and freeze-up in rivers
[AD-A147088] N85-16274

RIVETED JOINTS
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints — aircraft structures
[LBF-FB-172/84] N85-16219

ROBOTICS
Fiat, Peugeot introduce integrated robotized engine: CAD used N85-15933
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
Computer science research in Europe
[AD-A146905] N85-16482
JPL Robotics Laboratory computer vision software library
[NASA-CR-174272] N85-16491

ROBOTS
NyKINA, a further development of KINM 22 — simulation of a robot attack on an aircraft
[FOA-C-20559-D6(E3)] N85-15720
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa)
[AD-A147890] N85-16458
ROCKET ENGINE CASES
Integral boost, heat protection, port covers and transition N85-15813
ROCKET ENGINE DESIGN
Ramjet air induction system design for tactical missile application N85-15811
ROCKET ENGINES
Ramjet and Ramrocket Propulsion Systems for Missiles
[AGARD-LS-136] N85-15809
Ramjet and Ramrocket Propulsion Systems for Missiles: Introduction and overview N85-15810
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812
ROCKET EXHAUST
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15801
High altitude chemically reacting gas particle mixtures. Volume 2: Program manual for RAMP2 — rocket nozzle and orbital plume flow fields
[NASA-CR-171827] N85-15802
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual — rocket nozzle and orbital plume flow fields
[NASA-CR-171828] N85-15803
ROCKET NOZZLES
A computer program for the performance analysis of scarfed nozzles
[AD-A147370] N85-15730
Carbon/carbon rocket motor exit cone reinforcement
[AD-D011360] N85-15799
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15801
High altitude chemically reacting gas particle mixtures. Volume 2: Program manual for RAMP2 — rocket nozzle and orbital plume flow fields
[NASA-CR-171827] N85-15802
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual — rocket nozzle and orbital plume flow fields
[NASA-CR-171828] N85-15803
Thermophysical property testing using transient techniques
[AD-A147065] N85-16664
ROCKET PROPELLED SLEDS
Nondestructive deceleration of a rocket sled — target penetration tests
[FOA-C-20549-D3] N85-15771
ROCKET THRUST
Qualification of an electrothermal hydrazine thruster with a vacuum thrust of 0.5 to 2.0 N
[BMFT-FB-W-84-043] N85-15808
ROCKS
In-situ stress determination in soil and rock using the acoustic emission method
[AD-A147459] N85-16215
RODS
Nonlinear waves in a rod. Results for incompressible elastic materials
[AD-A147485] N85-16216
ROLLER BEARINGS
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184
ROLLERS
Stability of rigid motions and rollers in bicomponent flows of immiscible liquids
[AD-A147302] N85-16061
ROOM TEMPERATURE
Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens
[AD-D011311] N85-16163
ROTARY WINGS
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715
ROTATING DISKS
CFM 56-2. Oligocyclic fatigue of the turbotan disk: Dimensionning and tests for verification and improvements N85-15750
Possibilities for a more accurate life prediction of components — gas turbine disks N85-16198
ROTATING MIRRORS
Dual band, low sidelobe, high efficiency mirror antenna
[AD-D011329] N85-15980
ROTATING SPHERES
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies
[AD-A146964] N85-16069
Sedimentation of two arbitrarily oriented spheroids in a viscous fluid
[AD-A147303] N85-16062
ROTOR AERODYNAMICS
The UH-1H helicopter icing flight test program: An overview
[NASA-TM-86925] N85-15702
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
ROTOR BLADES (TURBOMACHINERY)
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
ROTOR SPEED
Shutdown characteristics of the Mod-O wind turbine with aileron controls
[NASA-TM-86918] N85-16299
ROTORS
Superconducting rotor dynamics
[AD-A147176] N85-16000
Development of a Navier-Stokes rotor and stator analysis
[AD-A146967] N85-16070
Theoretical and experimental study of hydro-elastic instability on the line of shafting of a rotating machine
[BLL-DOUNREAY-TR-937-(8091.9F)] N85-16174
ROVING VEHICLES
An autonomous roving vehicle for the planet Mars: A summary of over 15 years of research
[RPI-TR-MP-83] N85-16179
RUBBER
Rubber-modified epoxies. 1: Cure, transitions, and morphology
[AD-A147377] N85-15908
RUNGE-KUTTA METHOD
Art of programming programmable microcalculators. Part 12: Solution of differential equations N85-16043
RUNWAYS
System for rapid repair of damaged airfield runways
[AD-D011325] N85-15754
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
RURAL LAND USE
The challenge of food production: The importance of climate N85-16361
RYDBERG SERIES
Infrared emission and atomic transitions
[AD-A147840] N85-16607
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing
[AD-A146827] N85-16623

S

SAFETY
Flame-resistant materials for use in pyrotechnic safety clothing
[AD-A146857] N85-15801
Safety evaluation of an electronic totalizer containing a Li/(CF)x cell
[AD-A147306] N85-16305
SAFETY DEVICES
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701
Powered articulated headrest system
[AD-D011353] N85-15710
SALTS
New data on presence of ores in salt dome structures of Dnieper-Donets Basin N85-16234
SAMARIUM
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824
SAMPLING
The influence of sample collection and methods of analysis on chemical concentrations measured in rainwater
[KNMI-TR-55] N85-15853
A complete characterization of triply balanced matrices with applications to survey sampling
[AD-A147083] N85-16542
Bayesian estimation of undetected errors
[AD-A147198] N85-16545
SAN FRANCISCO (CA)
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10044] N85-16244
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10053] N85-16249
SATELLITE DESIGN
QUASAT: Technical aspects of the proposed mission — VLBI satellite N85-16706
SATELLITE IMAGERY
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10044] N85-16244
Characterizing the scientific potential of satellite sensors — San Francisco, California
[E85-10053] N85-16249
LANDSAT-4 Thematic Mapper Modulation Transfer Function (MFT) evaluation — California and New Mexico
[E85-10055] N85-16250
Proceedings of the Second Annual Symposium on Mathematical Pattern Recognition and Image Analysis Program
[E85-10056] N85-16251
Exploring the use of structural models to improve remote sensing agricultural estimates N85-16259
Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260
Rectification of single and multiple frames of satellite scanner imagery using points and edges as control N85-16263
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
SATELLITE INSTRUMENTS
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5
[E85-10059] N85-16270
Thematic Mapper. Volume 2: Flight model preshipment review
[E85-10060] N85-16271
SATELLITE OBSERVATION
Autoregressive spectral estimation for two dimensional time series N85-16258
Remote sensing of the high latitude ionosphere
[AD-A147881] N85-16405
SATELLITE ORBITS
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793
SATELLITES
On-orbit support of DARPA-301 payload
[AD-A146897] N85-15767
SCALE
Model robust response surface designs: Scaling 2-level factorials
[AD-A147494] N85-16558
SCALING LAWS
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560
SCATTERING CROSS SECTIONS
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606
SCENE ANALYSIS
Texture classification using autoregressive filtering N85-16254
SCHEDULING
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487
SCHMIDT CAMERAS
Some aspects of photography with a small Schmidt camera — astronomical photography N85-16116
The UK Schmidt telescope and the facilities in Edinburgh N85-16121
Astronomers' problems with the calibration of Schmidt plates N85-16126
SCHMIDT TELESCOPES
What do we want: Increased speed, resolution, contrast or DQE? — astronomical photography N85-16115
The UK Schmidt telescope and the facilities in Edinburgh N85-16121
An investigation into the fidelity of reproduction of UKST original objective prism plates on to film — United Kingdom Schmidt Telescope (UKST) N85-16123
Sub-beam prism used at the Boscha Schmidt telescope N85-16125
The Malin effect in stellar photography N85-16131

SCHOTTKY DIODES
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15995
Buried junction enhanced Schottky barrier device
[AD-D011399] N85-16635
SCIENTIFIC SATELLITES
The galaxy scene and QUASAT — VLBI satellite N85-16703
The QUASAT mission: An overview N85-16704
SCINTILLATION
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade
[NASA-TM-86914] N85-15689
SCOOPS
Ramjets with supersonic combustion N85-15817
SCREEN EFFECT
Method for forming electromagnetic-wave-screening composite N85-15930
SEA ICE
Intermediate results of radar backscatter measurements from summer sea ice
[AD-A147212] N85-15960
Ice dynamics
[AD-A147376] N85-16278
Investigation of the ice dynamics in the marginal ice zone
[AD-A146729] N85-16411
SEA WATER
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
SEALS (STOPPERS)
High temperature ultra-high vacuum infrared window seal
[AD-D011333] N85-15890
Cryogenic glass-to-metal seal
[AD-D011370] N85-15911
SEAPLANES
The effect of changes in the angle of incidence in the event of a richochet at a float step
[RAE-TRANS-2120] N85-15712
SEDIMENTS
Pulse transmission through frozen silt
[AD-A147108] N85-15958
Ocean acoustics
[AD-A147062] N85-16591
SEISMIC ENERGY
Deployment of a regional array in Norway
[AD-A147032] N85-16330
SEISMIC WAVES
Nonlinear wave propagation study
[AD-A147011] N85-16329
Short period guided waves over oceanic and continental paths
[AD-A147053] N85-16331
SEISMOGRAPHS
Microseism level, time variations at Turkmen seismic stations studied N85-16231
Deployment of a regional array in Norway
[AD-A147032] N85-16330
SEISMOLOGY
Microseism level, time variations at Turkmen seismic stations studied N85-16231
General model of earthquakes and the place of warnings in it N85-16232
Research activities of the Norwegian seismic array (NORSAR)
[AD-A146778] N85-16326
Deployment of a regional array in Norway
[AD-A147032] N85-16330
Short period guided waves over oceanic and continental paths
[AD-A147053] N85-16331
Seismicity of southern Sweden
[FOA-C-20543-T1] N85-16340
Research of inverse methods to describe the structure of the earth and ocean bottom
[AD-A147062] N85-16541
SELENIDES
Thio and seleno compounds of the transition metals with the d (o) configuration
[BLL-MINTEK-TR-1177-(5810.5759)] N85-15863
SELF EXCITATION
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
SEMANTICS
Functional semantics of modules
[AD-A146923] N85-16500
SEMICONDUCTOR DEVICES
Charge domain filters for enhanced monolithic signal processing
[AD-A147428] N85-15964
An asymptotic analysis of a transient p-n junction model
[AD-A147270] N85-16004
The constant current strain gauge bridge
[ARL-STRUC-TM-385] N85-16097
Superlattice ultrasonic wave generator
[AD-D011363] N85-16585
Two carrier dual injector apparatus
[AD-D011357] N85-16646
SEMICONDUCTOR JUNCTIONS
Multijunction cells for concentrators: Technology prospects
[NASA-CR-174259] N85-16295
SEMICONDUCTOR LASERS
Diffusion barrier for long wavelength laser diodes
[AD-D011390] N85-16157
Phased locked array laser systems
[AD-D011317] N85-16164
SEMICONDUCTORS (MATERIALS)
Float zone experiments in space
[NASA-CR-171284] N85-15786
Determination of moments of initial estimate during linear approximation of distribution of ejected impurity N85-16045
Determination of parameters of doped thin semiconductor layers from plasmatic minimum of reflection coefficient for infrared radiation N85-16047
Superlattice ultrasonic wave generator
[AD-D011363] N85-16585
Ion microscopy of metals and semiconductors
[AD-A147118] N85-16626
Ion implantation and laser processing of III-V compound semiconductors with applications to the fabrication of microwave devices
[AD-A146848] N85-16651
Laser annealing of ion implanted semiconductors
[AD-A146979] N85-16652
Method of preparing single crystalline cubic silicon carbide layers
[AD-D011305] N85-16653
Clusters of defects in semiconductors
[AD-A147426] N85-16655
Electron distribution function and mobility in 3-5 compounds for high and low fields
[AD-A147447] N85-16658
X-ray and backscattering analysis of ion implantation phenomena in GaAs and related compounds
[AD-A147449] N85-16659
Transport properties and distribution functions in 3-5 semiconductors
[AD-A147525] N85-16660
SENSITIVITY
Optical fibers with reduced pressure sensitivity to high frequency acoustic field
[AD-D011306] N85-16627
SENSITOMETRY
Astronomical photography 1984 — conferences
[ROE-OR-14] N85-16102
Recalibration of the KPNO spot sensitometers — Kitt Peak National Observatory N85-16103
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment — X-ray films N85-16104
SENSIT.FOR: A program for sensitometric reduction N85-16105
A spectrosensitometer with an absolute calibration N85-16106
SENSORY STIMULATION
Central regulation of sensory flow in human visual system N85-16435
SEPARATED FLOW
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
The structure of dilute combusting sprays
[NASA-CR-174836] N85-15728
SEQUENTIAL ANALYSIS
Nonlinear processing of optical pulse signals N85-16026
Local dependence and point processes of exceedances in stationary sequences
[AD-A147859] N85-16578
SERIES (MATHEMATICS)
Local dependence and point processes of exceedances in stationary sequences
[AD-A147859] N85-16578
SERIES EXPANSION
A propagator expansion method for solving linearized plasma kinetic equations with collisions
[AD-A147524] N85-16640
SERPENTINE
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272
SERVICE LIFE
Structural flight load measurement demonstration of structural integrity N85-15670
CF-5 vertical stabilizer flight load survey N85-15673
US Army helicopter operational flight loads N85-15675
Helicopter data acquisition in WHL N85-15676
SERVOMECHANISMS
Tracking servo compensator with rate aiding
[AD-D011372] N85-15971
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
Mirror actuator control system
[AD-D011383] N85-16619
SET THEORY
Stable monotone variational inequalities
[AD-A147123] N85-16544
SHAFTS (MACHINE ELEMENTS)
Improvement of the corrosion resistance of turbine engine bearings
[AD-A147430] N85-15731
Theoretical and experimental study of hydro-elastic instability on the line of shafting of a rotating machine
[BLL-DOUNREAY-TR-937-(9091.9F)] N85-16174
Measurement and evaluation of the loading of shafts by torsional vibrations N85-16222
SHALE OIL
Oil-shale exploration expansion urged N85-16317
SHALLOW WATER
An analytical model of periodic waves in shallow water
[AD-A147501] N85-16085
An analytical model of periodic waves in shallow water
[AD-A147502] N85-16086
SHAPED CHARGES
Making high explosive bodies for shaped charges by casting or pressing. Shaped charge research at Research Institute of National Defence (FOA) in 1972 - 1983, part 1
[FOA-C-20554-D4-PT-1] N85-15923
SHAPES
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6
[NASA-TM-86345] N85-15657
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
SHEAR LAYERS
Aero-optics experimental techniques
[AD-A146755] N85-16067
SHEAR STRENGTH
Mechanical property data 7050-t736511 alloy
[AD-A147365] N85-15882
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909
SHEAR STRESS
Studies of the wall shear stress in a turbulent pulsating pipe flow
[AD-A146772] N85-16068
SHELL THEORY
A review of imperfection sensitivity of stiffened shells
[AD-A147311] N85-16213
SHELLS (STRUCTURAL FORMS)
Finite element procedures applicable to nonlinear analysis of reinforced concrete shell structures
[AD-A146796] N85-16209
A review of imperfection sensitivity of stiffened shells
[AD-A147311] N85-16213
SHELTERS
A comparison of lightning and nuclear electromagnetic pulse response of tactical shelters N85-16350
SHIPS
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
SHOCK (PHYSIOLOGY)
Fatal hemorrhagic shock and acetate solutions
[AD-A146754] N85-16444
SHOCK WAVES
A comparative study of the nonuniqueness problem of the potential equation
[NASA-TP-2385] N85-15694
Numerical reconstruction of part of an actual blast-wave flow field to agree with available experimental data
[UTIAS-TN-251] N85-16061
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072
On the asymptotic analysis of travelling shocks and phase boundaries in elastic bars
[AD-A147239] N85-16076
Nonlinear waves in a rod. Results for incompressible elastic materials
[AD-A147485] N85-16216
SHORELINES
Progress in developing tidal electric power plants reported N85-16314
SHORT CIRCUITS
Diagnosis of insulation defects in 1000+ V distribution networks with insulated neutral N85-16044

SHORT TAKEOFF AIRCRAFT
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update [AD-A146966] N85-15661
SHORT WAVE RADIATION
SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas [AD-A147526] N85-16641
SHUTDOWNS
Shutdown characteristics of the Mod-O wind turbine with aileron controls [NASA-TM-86918] N85-16299
SIALON
Oxidation resistance of silicon ceramics [NASA-TM-77429] N85-15898
SIBERIA
Deep structure of Western Siberia N85-16235
SIDELOBES
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna [NASA-CR-174268] N85-15944
Array sidelobes, error tolerance, gain, and beamwidth [AD-A147004] N85-15956
SIEVES
Estimation for a semimartingale regression model using the method of sieves [AD-A146809] N85-16527
SIGNAL ANALYSIS
Interactive Signal Analysis Software (ISAS). User's manual [AD-A146999] N85-16485
Use of the analytic signal in ultrasonic imaging [DE84-016843] N85-16598
SIGNAL ANALYZERS
Design of an analog spectrum analyzer for probing experiments [AD-A147384] N85-15963
SIGNAL DETECTION
Potential effectiveness of spatial processing in detecting signals against background of interfering reflections N85-16032
SIGNAL DETECTORS
Lightweight, broadband Rayleigh wave transducer [AD-D011345] N85-16584
SIGNAL ENCODING
Improved digital baseband transmission by application of maximum likelihood decoding to an 8-level signal generated by convolution and block coding [FI-44-TBR-93] N85-15973
SIGNAL GENERATORS
Formation of radio signals with low out-of-band radiation N85-16018
SIGNAL MEASUREMENT
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas [AD-A147481] N85-16170
SIGNAL PROCESSING
Adaptive MTI (Moving Target Indicator) system [AD-D011361] N85-15937
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix [AD-A146848] N85-15953
Studies in statistical signal processing [AD-A147130] N85-15959
Charge domain filters for enhanced monolithic signal processing [AD-A147428] N85-15964
New technology high efficiency and high stability color motion video compression system [AD-A147523] N85-15968
Parallel processor configuration for adaptive antenna arrays [AD-D011347] N85-15970
Modern signal processing and reconnaissance --- conferences [FOA-C-30374-E1] N85-15975
Electronics research at the University of Texas at Austin [AD-A146900] N85-15998
USSR report: Electronics and electrical engineering [JPRS-UEE-84-018] N85-16014
Digital signal demodulators with single-sideband N85-16019
USSR report: Electronics and electrical engineering [JPRS-UEE-84-017] N85-16025
Nonlinear processing of optical pulse signals N85-16026
Analysis of effectiveness of partial optimization of spatial processing systems N85-16031
Potential effectiveness of spatial processing in detecting signals against background of interfering reflections N85-16032
Digital thermometer with linearizer on slide wire N85-16049
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
White-light optical information processing and holography [AD-A146938] N85-16138
Interactive Signal Analysis Software (ISAS). User's manual [AD-A146999] N85-16485
Electro-optical target detection [AD-D011366] N85-16617
Solid state research [NASA-CR-174265] N85-16656
SIGNAL RECEPTION
Analysis of threshold effects during estimation of arrival time of optical signals N85-16030
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
SIGNAL REFLECTION
Potential effectiveness of spatial processing in detecting signals against background of interfering reflections N85-16032
SIGNAL TO NOISE RATIOS
Reference oscillator stability effect on clutter cancellation in a radar system N85-15946
Improved digital baseband transmission by application of maximum likelihood decoding to an 8-level signal generated by convolution and block coding [FI-44-TBR-93] N85-15973
Some applications of signal-to-noise in photographic stellar photometry N85-16132
Electro-optical target detection [AD-D011366] N85-16617
SIGNAL TRANSMISSION
Hardwire missile receiver coupler [AD-D011350] N85-15936
Improved digital baseband transmission by application of maximum likelihood decoding to an 8-level signal generated by convolution and block coding [FI-44-TBR-93] N85-15973
SILICATES
Calculation of energy of atomization in silicate tetrahedron Si4(4-) [BLL-M-36000-(5828.4)] N85-16599
SILICON
Microbiological method for the desiliconization of high-silica bauxites [BLL-MINTEK-TR-1168-(5810.5759)] N85-15864
SILICON ALLOYS
Optical properties of composite materials [AD-A146766] N85-15828
SILICON CARBIDES
Fundamental tribological properties of ceramics [NASA-TM-86915] N85-15893
Oxidation resistance of silicon ceramics [NASA-TM-77429] N85-15898
Development and production of improved silicon carbide powder for pressureless sintering and hot pressing [BMFT-FB-T-84-211] N85-15917
Gas cooled fuel cell systems technology development [NASA-CR-174732] N85-16291
Method of preparing single crystalline cubic silicon carbide layers [AD-D011305] N85-16653
SILICON COMPOUNDS
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory [AD-A147161] N85-15844
SILICON NITRIDES
Development and production of improved alpha-phase silicon nitride powders for hot pressing and sintering [BMFT-FB-T-84-208] N85-15830
Oxidation resistance of silicon ceramics [NASA-TM-77429] N85-15898
Silazane precursors to silicon nitride [AD-A146791] N85-15899
SILVER HALIDES
Infrared presensitization photography [AD-A146968] N85-16139
SIMPLEX METHOD
The stable evaluation of multivariate b-splines [AD-A147366] N85-16551
An iterative scheme for linear complementarity problems [AD-A147464] N85-16555
SIMULATION
Region 1 birkeland currents from a global MHD simulation of the magnetosphere [AD-A147435] N85-16335
Matrix display simulation [AD-D011371] N85-16695
SINGLE CRYSTALS
Low noise multiple crystal-controlled oscillator [AD-D011401] N85-16010
Crystal growth and characterization of BaMgF4 [AD-A146805] N85-16650
SINGLE SIDEBAND TRANSMISSION
Digital signal demodulators with single-sideband N85-16019
Use of the analytic signal in ultrasonic imaging [DE84-016843] N85-16598
SINTERING
Development and production of improved alpha-phase silicon nitride powders for hot pressing and sintering [BMFT-FB-T-84-208] N85-15830
Influence of size grading of sintering ore on the sintering process [BLL-M-36004-(5828.4)] N85-15854
Procedure for investigating high-temperature properties of iron-ore materials [BLL-M-36020-(5828.4)] N85-15868
The determination of vertical sintering speed of sinter charges [BLL-M-36033-(5828.4)] N85-15869
Solid-phase sintering of tantalum carbide [BLL-M-36013-(5828.4)] N85-15872
Fatigue strength of different sintered steels and design criteria for porous material (PM) parts [LBF-FB-170/84] N85-15886
Development and production of improved silicon carbide powder for pressureless sintering and hot pressing [BMFT-FB-T-84-211] N85-15917
SITE SELECTION
Potential affiliate stations to work with the EVN --- European VLBI Network; QUASAT N85-16708
SIZE DISTRIBUTION
Experimental study of the spray characteristics of a research airblast atomizer [NASA-TM-86911] N85-15727
SKIN (ANATOMY)
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
SKY BRIGHTNESS
NBS (National Bureau of Standards) daylight availability database [PB84-245745] N85-16688
SKYLAB PROGRAM
The evolution of civilian in-space infrastructure, i.e., space station concepts in the United States N85-15788
SLAGS
Calculation of energy of atomization in silicate tetrahedron Si4(4-) [BLL-M-36000-(5828.4)] N85-16599
SLENDER BODIES
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies [AD-A146964] N85-16069
SLOPES
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach --- Costa Rica [E85-10051] N85-16247
SNAP
SNAP (Space Nuclear Auxiliary Power) reactor overview [AD-A146831] N85-16612
SNOW
Snow characterization measurements from SNOW-TWO/Smoke Week 6 [AD-A147423] N85-16402
SNOW COVER
Synoptical observations of snow depths at Dutch meteorological stations, 1956 - 1977 [KNMI-TR-51] N85-16407
SOCIAL FACTORS
Socio-economic impact of climate --- Mexico N85-16372
Climate and fisheries: A Peruvian case study N85-16373
Job and family stress as predictors of pilot health, job satisfaction and performance [AD-A142178] N85-16464
SODIUM
Forces on neutral atoms due to electromagnetic fields [AD-A146984] N85-16603
SODIUM CHLORIDES
Salt action on concrete [AD-A147812] N85-15912
SODIUM COMPOUNDS
Synthesis and properties of Hexachloromolybdates(5) and related species [AD-A139599] N85-15852
SOFTNESS
Strength and aging behaviour of soft soldered joints [BLL-T6365/BG/WH800/84] N85-15862
SOFTWARE ENGINEERING
Trends in development of software for computer-aided analysis of large-scale integrated circuits N85-16055

JPL Robotics Laboratory computer vision software library
[NASA-CR-174272] N85-16491
Software test handbook
[AD-A146844] N85-16498
Functional semantics of modules
[AD-A146923] N85-16500
On the structure of information in software
[AD-A147580] N85-16511
Ultrasound instrumentation for the 7 inch Mach seven tunnel
[NASA-CR-174277] N85-16586

SOIL MECHANICS
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
Computer program for determining induced stresses and consolidation settlements (CSETT)
[AD-A146730] N85-16493

SOILS
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
In-situ stress determination in soil and rock using the acoustic emission method
[AD-A147459] N85-16215
An integrated remote sensing approach for identifying ecological range sites — parker mountain
[E85-10050] N85-16246
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica
[E85-10051] N85-16247
Fate and disposition of trichloroethylene in surface soils
[AD-A147918] N85-16321
Computer program to compute soil thermal conductivity from transient temperature measurements
[PB85-100550] N85-16341
Computer program for determining induced stresses and consolidation settlements (CSETT)
[AD-A146730] N85-16493

SOLAR ARRAYS
Demonstration of transparent solar array module design
[NASA-CR-174257] N85-16302

SOLAR CELLS
Results of the 1984 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-174270] N85-16294
Multijunction cells for concentrators: Technology prospects
[NASA-CR-174259] N85-16295

SOLAR COLLECTORS
Multijunction cells for concentrators: Technology prospects
[NASA-CR-174259] N85-16295
Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings
[NASA-CR-174274] N85-16296
Performance and cost of energy transport and storage systems for dish applications using reversible chemical reactions
[NASA-CR-174263] N85-16298
Solar energy conversion based on the principle of fluorescent collectors. Installation of a test collector to deliver several Watts power
[BMFT-FB-T-84-192] N85-16308
Solar energy conversion based on the principle of fluorescent collectors
[BMFT-FB-T-84-193] N85-16309

SOLAR CORONA
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726

SOLAR ELECTRONS
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726

SOLAR ENERGY
National Bureau of Standards passive solar test facility: Instrumentation and site handbook
[PB85-100451/GAR] N85-16148
Multijunction cells for concentrators: Technology prospects
[NASA-CR-174259] N85-16295
Evaluation of the measured energy performance of four solar systems
[AD-A147912] N85-16306
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605

SOLAR ENERGY CONVERSION
Evaluation of the measured energy performance of four solar systems
[AD-A147912] N85-16306
Solar energy conversion based on the principle of fluorescent collectors. Installation of a test collector to deliver several Watts power
[BMFT-FB-T-84-192] N85-16308
Solar energy conversion based on the principle of fluorescent collectors
[BMFT-FB-T-84-193] N85-16309
Heliostat tested N85-16318
Lunar nuclear power feasibility study
[NASA-CR-171831] N85-16611

SOLAR HEATING
Development of design and economic parameters for passive solar systems
[AD-A147181] N85-16303

SOLAR ORBITS
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793

SOLAR RADIATION
Natural interference phenomena affecting spaceborne receivers
[NASA-CR-174256] N85-15798
Deciduous forest radiation regimes: Effects of forest structure, phenology and Earth-Sun geometry upon their spatial, temporal and spectral variability
[AD-A146804] N85-16327
NBS (National Bureau of Standards) daylight availability database
[PB84-245745] N85-16688

SOLAR SYSTEM
The abundance of deuterium in the outer solar system from ground-based measurements of monodeuterated methane N85-16725

SOLAR WIND
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726
Spicules and surges
[AD-A146785] N85-16727

SOLDERED JOINTS
Strength and aging behaviour of soft soldered joints
[BLL-T6385/BG/WH600/84] N85-15862
Investigation of the creep behaviour of soft soldered joints with solder L-SnAg5 at ambient temperature
[BLL-T6383/BG/WH798/84] N85-15865

SOLID ELECTROLYTES
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902

SOLID LUBRICANTS
Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C
[NASA-CR-174837] N85-15895

SOLID PHASES
Influence of temperatures of reactants on nature of product of solid-phase reactions
[BLL-M-36019-(5828.4)] N85-15832
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36028-(5828.4)] N85-15855
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase
[BLL-M-36023-(5828.4)] N85-15873

SOLID PROPELLANT ROCKET ENGINES
Carbon/carbon rocket motor exit cone reinforcement
[AD-D011360] N85-15799
Solid propellant Ramrockets N85-15816

SOLID PROPELLANTS
Special problems of Ramjet with solid fuel N85-15815
Combustion properties of fuel-rich magnesium propellants with HTPB as binder
[FOA-C-20555-D1] N85-15924

SOLID ROCKET PROPELLANTS
An optical and mass spectrometric study of the aluminum-oxygen flame
[AD-A147434] N85-15849
Thermophysical property testing using transient techniques
[AD-A147085] N85-16664

SOLID STATE DEVICES
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
Basic research in electronic (JSEP): Joint Services Electronics Program
[AD-A147891] N85-16007
Solid state research
[NASA-CR-174285] N85-16656

SOLID WASTES
Immobilization of toxic waste by embedding it in bitumen
[OEFZS-4277] N85-16322

SOLIDIFICATION
The growth of metastable peritectic compounds
[NASA-CR-171289] N85-15824
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15825
Investigation of granules of molybdenum-base alloys obtained with pulsed discharges
[BLL-M-36012-(5828.4)] N85-15871
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15880
Analysis of the heating process of a body in a melt
[BLL-M-36014-(5828.4)] N85-16057

SOLIDIFIED GASES
Understanding the high pressure properties of molecular solids and molecular surfaces deposited on hetrogeneous substrates
[NASA-CR-174262] N85-16649

SOLIDS
Optics of solids (surface related) and effect of surface roughness on MOS
[AD-A146883] N85-15996
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507

SOLIDUS
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876

SOLUBILITY
Reciprocal solubility of phases in multi-component systems
[BLL-M-36003-(5828.4)] N85-15870
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15880
Properties of miscible polymer blends
[AD-A147090] N85-15903

SOLUTIONS
Fatal hemorrhagic shock and acetate solutions
[AD-A146754] N85-16444
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560

SOOT
Mechanism of soot formation
[AD-A146817] N85-15841

SOUND AMPLIFICATION
Study of optical sound generation and amplification
[AD-A147359] N85-16592

SOUND FIELDS
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590
Optical fibers with reduced pressure sensitivity to high frequency acoustic field
[AD-D011306] N85-16627

SOUND PROPAGATION
Study of optical sound generation and amplification
[AD-A147359] N85-16592

SOUND TRANSMISSION
Current and current shear effects in the parabolic approximation for underwater sound channels
[AD-A147833] N85-16597

SOUND WAVES
On the long range propagation of sound over irregular terrain
[NASA-CR-3862] N85-16589

SOUNDING
Khibiny experiment described N85-16230

SOUTH AMERICA
Climate Conference for Latin America and the Caribbean
[WMO-632] N85-16352
Review of climate problems in Latin America and the Caribbean N85-16354
Climate and climate data. Report on the workshop held in Brasilia (Argentina) from 11-15 April 1983 N85-16357
The climate in food production in Latin America N85-16359
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
Climatological information and water resources N85-16367
Energy and climate: Problems in Latin America N85-16375
Education and training for the climate related activities in Latin America and the Caribbean N85-16379

SOUTH DAKOTA
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265

SOYBEANS
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry
[E85-10040] N85-16241
SPACE COMMERCIALIZATION
Civilian space stations and the US future in space
[OTA-STI-241] N85-15781
Issues and findings N85-15782
Space infrastructure N85-15783
Toward a goal-oriented civilian space program N85-15786
SPACE ENVIRONMENT SIMULATION
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174266] N85-16639
SPACE EXPLORATION
Man in Space: National Historic Landmark Theme Study
[PB85-107233/GAR] N85-15768
Title 2: National Commission on Space (Public Law 98-361) N85-15791
SPACE FLIGHT
BDLI memorandum on the future of space flight in the Federal Republic of Germany
[NASA-TM-77624] N85-15765
SPACE FLIGHT FEEDING
Feasibility of producing a range of food products from a limited range of undifferentiated major food components
[NASA-CR-177329] N85-16473
SPACE FLIGHT STRESS
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427
SPACE HEATING (BUILDINGS)
Hangar heating and energy conservation manual
[AD-A147893] N85-15762
SPACE LAW
Outer space law: A problem of astronautics
[NASA-TM-77760] N85-16697
SPACE MISSIONS
On-orbit support of DARPA-301 payload
[AD-A146897] N85-15767
The investigation of tethered satellite system dynamics
[NASA-CR-171278] N85-15772
SNAP (Space Nuclear Auxiliary Power) reactor overview
[AD-A146831] N85-16612
SPACE NAVIGATION
Errors of analog of inertial coordinate systems modeled in astronavigation system N85-16028
A short note on the high precision navigation of QUASAT N85-16722
SPACE POWER REACTORS
Lunar nuclear power feasibility study
[NASA-CR-171831] N85-16611
SPACE PROGRAMS
A buyer's guide to space infrastructure N85-15784
Broadening the debate N85-15785
Toward a goal-oriented civilian space program N85-15786
Results of principal NASA studies on space station uses and functional requirements N85-15787
Title 2: National Commission on Space (Public Law 98-361) N85-15791
SPACE SHUTTLE MISSION 41-G
Atmospheric environment for Space Shuttle (STS-41G) launch
[NASA-TM-86486] N85-16320
SPACE SHUTTLE ORBITERS
Columbia: The first 5 flights entry heating data series. Volume 1: An overview
[NASA-CR-171820] N85-15777
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 8 to 1.5
[NASA-TP-2365] N85-15778
SPACE SHUTTLE PAYLOADS
The calibration of photographic and spectroscopic films: A densitometric analysis of IIaO film flown aboard the Space Shuttle 3
[NASA-CR-174278] N85-16101
Lunar nuclear power feasibility study
[NASA-CR-171831] N85-16611
SPACE SHUTTLES
Issues and findings N85-15782
Space infrastructure N85-15783
A buyer's guide to space infrastructure N85-15784
Reduction method for thermal analysis of complex aerospace structures
[NASA-TP-2373] N85-16066
SPACE STATIONS
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773
Civilian space stations and the US future in space
[OTA-STI-241] N85-15781
Issues and findings N85-15782
Space infrastructure N85-15783
A buyer's guide to space infrastructure N85-15784
Broadening the debate N85-15785
Toward a goal-oriented civilian space program N85-15786
Results of principal NASA studies on space station uses and functional requirements N85-15787
The evolution of civilian in-space infrastructure, i.e., space station concepts in the United States N85-15788
International involvement in a civilian space station program N85-15789
Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements N85-15790
Financing considerations and Federal budget impacts N85-15792
Space Station truss structures and construction considerations
[NASA-TM-86338] N85-15796
SPACE SUITS
Flame resistant fibrous materials development
[NASA-CR-167817] N85-15827
SPACE TRANSPORTATION
Space infrastructure N85-15783
SPACE-TIME FUNCTIONS
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
SPACEBORNE ASTRONOMY
QUASAT: A VLBI observatory in space — conferences
[ESA-SP-213] N85-16700
The galaxy scene and QUASAT — VLBI satellite N85-16703
The QUASAT mission: An overview N85-16704
Some prospects of space VLBI N85-16705
QUASAT: Technical aspects of the proposed mission — VLBI satellite N85-16706
A study on the imaging potential of QUASAT — spaceborne VLBI N85-16707
Correlator and data processing requirements for QUASAT N85-16709
Processing system for space VLBI N85-16711
Testing theories of superluminal motion — QUASAT N85-16714
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715
Very Long Base Interferometry (VLBI) in space and X-ray observations of compact sources in active galactic nuclei N85-16716
The wide-range space radio interferometer N85-16717
The relevance of QUASAT to the star formation problem N85-16718
Galactic OH and H2O masers — QUASAT project N85-16719
Water masers and distance measurements: The impact of QUASAT N85-16721
A short note on the high precision navigation of QUASAT N85-16722
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies — QUASAT N85-16723
SPACEBORNE EXPERIMENTS
Controlled ecological life support system higher plant flight experiments
[NASA-CR-177323] N85-16471
SPACEBORNE TELESCOPES
Pointing and control system design study for the space infrared telescope facility (SIRTF)
[NASA-CR-166612] N85-15795
SIRTF: The next step
[NASA-TM-86663] N85-16724
SPACECRAFT COMMUNICATION
Spacecraft system study: A study to define the impact of laser communication systems on their host spacecraft
[NASA-CR-175272] N85-16159
SPACECRAFT COMPONENTS
On-orbit support of DARPA-301 payload
[AD-A146897] N85-15767
A total dose characterization of five commercial analog multiplexers
[AD-A146886] N85-15997
SPACECRAFT CONSTRUCTION MATERIALS
Space Station truss structures and construction considerations
[NASA-TM-86338] N85-15796
SPACECRAFT DESIGN
Pointing and control system design study for the space infrared telescope facility (SIRTF)
[NASA-CR-166612] N85-15795
SPACECRAFT ENVIRONMENTS
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773
A buyer's guide to space infrastructure N85-15784
SPACECRAFT EQUIPMENT
Power transfer from natural emitters to collection apertures at microwave wavelengths
[NASA-CR-174275] N85-15989
Spaceborne receivers: Basic principles
[NASA-CR-174269] N85-15990
SPACECRAFT INSTRUMENTS
Natural interference phenomena affecting spaceborne receivers
[NASA-CR-174256] N85-15798
Reduction of signal modulation caused by polarization in visible optical scanning systems
[AD-D011389] N85-16620
SPACECRAFT PERFORMANCE
Spacecraft system study: A study to define the impact of laser communication systems on their host spacecraft
[NASA-CR-175272] N85-16159
SPACECRAFT POWER SUPPLIES
Engineering model system study for a regenerative fuel cell: Study report
[NASA-CR-174801] N85-16292
Results of the 1984 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-174270] N85-16294
SPACECRAFT RADIATORS
Preliminary evaluation of a liquid belt radiator for space applications
[NASA-CR-174807] N85-15804
SPACECRAFT REENTRY
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 8 to 1.5
[NASA-TP-2365] N85-15778
SPACECRAFT TRACKING
The Western Aeronautical Test Range of NASA Ames Research Center
[NASA-TM-85924] N85-15756
SPACELAB
Space infrastructure N85-15783
SPALLATION
Salt action on concrete
[AD-A147812] N85-15912
SPARE PARTS
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16667
A simulation model for Air Launched Cruise Missile engine management
[AD-A147018] N85-16672
The Air Force can improve its forecasts of aircraft spare parts requirements
[AD-A147911] N85-16682
Estimating wartime support resource requirements. Statistical and related policy issues
[AD-A147923] N85-16685
SPATIAL DISTRIBUTION
Potential effectiveness of spatial processing in detecting signals against background of interfering reflections N85-16032
Determination of moments of initial estimate during linear approximation of distribution of ejected impurity N85-16045
Estimating location parameters in a mixture N85-16252
Spatial estimation from remotely sensed data via empirical Bayes models N85-16256
SPATIAL FILTERING
Analysis of effectiveness of partial optimization of spatial processing systems N85-16031
SPATIAL RESOLUTION
Rectification of single and multiple frames of satellite scanner imagery using points and edges as control N85-16263
The influence of the number of ground control points on the scene-to-map registration accuracy — Kansas, Louisiana, Mississipp, and Missouri N85-16264
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
Analysis of subpixel registration N85-16267
Use of the analytic signal in ultrasonic imaging
[DE84-016843] N85-16598
SPECIFIC HEAT
Thermophysical property testing using transient techniques
[AD-A147085] N85-16664
SPECIFIC IMPULSE
Ion thruster project
[NASA-TM-77726] N85-15805

SPECIFICATIONS
Natural environmental criteria for the space station definition and preliminary design, revised [NASA-TM-86460] N85-15773
A buyer's guide to space infrastructure N85-15784
Reliability analysis of local area networks, intermediate report [BLL-WH-610-(9091.9F)] N85-16520
SPECKLE PATTERNS
Measurement of high temperature strain by the laser-speckle strain gauge [NASA-TM-77751] N85-16207
SPECTRAL METHODS
On the instability of a 3-dimensional attachment line boundary layer: Weakly nonlinear theory and a numerical approach [NASA-CR-172504] N85-16063
Autoregressive spectral estimation for two dimensional time series N85-16258
SPECTRAL REFLECTANCE
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry [E85-10040] N85-16241
Spectral estimators of absorbed photosynthetically active radiation in corn canopies [E85-10041] N85-16242
Growth/reflectance model interface for wheat and corresponding model [E85-10058] N85-16269
SPECTRAL SENSITIVITY
SENSIT.FOR: A program for sensitometric reduction N85-16105
A spectrosensitometer with an absolute calibration N85-16106
The most effective astronomical photographic emulsions for recording of faint and low-contrast objects N85-16110
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5 [E85-10059] N85-16270
SPECTROHELIOGRAPHS
The evaluation of a deformable diffraction grating for a stigmatic EUV spectroheliometer [NASA-CR-174248] N85-16621
SPECTROMETERS
Comparison measurements on optical particle counters [BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
SPECTROSCOPY
A study of structural phase transitions using light scattering techniques [AD-A147261] N85-16654
SPECTRUM ANALYSIS
Laser spectroscopy of alkali atom-tetrahaloethylene reactions [AD-A147431] N85-15848
Design of an analog spectrum analyzer for probing experiments [AD-A147384] N85-15963
Power spectrum analysis of astronomical photographs digitised with small apertures N85-16127
Bragg cell spectrum analyzer specification [AD-D011320] N85-16629
SPEECH
Speech-action interrelationships in operational work N85-16418
SPEECH RECOGNITION
VOTAN V5000 speech recognition system performance test report [AD-A146726] N85-15950
Literature review of voice recognition and generation technology for Army helicopter applications [AD-A146878] N85-15954
Compository speech output (KOSA) with a very large scale integration speech synthesis chip [FI-13-TBR-18] N85-15974
SPHERES
The resistance and mobility functions of two equal spheres in low Reynolds number flow [AD-A147301] N85-16080
SPHERICAL COORDINATES
Convection schemes for use with curvilinear coordinate systems: A survey [AD-A147093] N85-16543
SPHERICAL SHELLS
Ultrasonic analysis of spherical composite test specimens [DE85-001591] N85-16197
SPHEROIDS
Sedimentation of two arbitrarily oriented spheroids in a viscous fluid [AD-A147303] N85-16082
SPICULES
Spicules and surges [AD-A146785] N85-16727
SPIN DYNAMICS
Application of quantum chemistry of atmospheric chemistry [AD-A147035] N85-15843
SPLINE FUNCTIONS
Multivariate spline methods in surface fitting N85-16257
A counterexample to a result of Strang and Fix concerning controlled approximation [AD-A147360] N85-16550
The stable evaluation of multivariate b-splines [AD-A147386] N85-16551
Spline methods for approximating quantile functions and generating random samples [NASA-TP-2389] N85-16565
SPLITTING
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations [AD-A147463] N85-16554
SPRAY NOZZLES
Experimental study of the spray characteristics of a research airblast atomizer [NASA-TM-88911] N85-15727
SPRAYERS
The structure of dilute combusting sprays [NASA-CR-174838] N85-15728
SPREAD SPECTRUM TRANSMISSION
Distributed reservation-based code division multiple access [AD-A147007] N85-15957
SPUTTERING
Optical properties of composite materials [AD-A146768] N85-15828
Rivista Tecnica Selenia, volume 9, number 1 N85-15945
Sputtering in thin film technology for optics --- laser systems N85-15948
STABILITY
Theoretical and experimental study of hydro-elastic instability on the line of shafting of a rotating machine [BLL-DOUNREAY-TR-937-(9091.9F)] N85-16174
STABILIZERS (FLUID DYNAMICS)
CF-5 vertical stabilizer flight load survey N85-15673
TUTOR (CL-41A) tail flight load survey N85-15678
STACKS
Gas cooled fuel cell systems technology development [NASA-CR-174732] N85-16291
STAGNATION FLOW
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies [AD-A146964] N85-16069
STANDARD DEVIATION
Battery control and fault detection method [AD-D011384] N85-16307
STANDARDS
NBS (National Bureau of Standards) and WR62 and WR90 reference noise standards [PB84-235704] N85-15977
Estimation of requirements for acceptable noise radiation level of communication transmitters N85-16017
What should DOE do to help establish voluntary consensus standards for measuring and rating the performance of PV modules? [NASA-CR-174265] N85-16297
STAR DISTRIBUTION
Automated star counts in nebulous areas N85-16137
STAR TRACKERS
Optimization of orientation in navigation by two heavenly bodies N85-16027
STARTING
Control system design language implementation of a gas turbine starting controller [AD-A147896] N85-15732
STATIC ELECTRICITY
International Aerospace and Ground Conference on Lightning and Static Electricity. 1984 technical papers. Supplement [NASA-CP-2356] N85-16343
STATIC FIRING
Qualification of an electrothermal hydrazine thruster with a vacuum thrust of 0.5 to 2.0 N [BMFT-FB-W-84-043] N85-15808
STATIONKEEPING
The investigation of tethered satellite system dynamics [NASA-CR-171278] N85-15772
STATISTICAL ANALYSIS
Statistical filtering as method for detecting transcrustal acoustic anomalies N85-16237
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS) [NASA-TP-2425] N85-16351
Lattice statistics [AD-A146862] N85-16530
A complete characterization of triply balanced matrices with applications to survey sampling [AD-A147083] N85-16542
Model robust response surface designs: Scaling 2-level factorials [AD-A147494] N85-16556
On the power functions of test statistics in order restricted inference [AD-A147126] N85-16566
STATISTICAL DISTRIBUTIONS
On a random difference equation for matrices and a characterization of the gamma distribution [AD-A146858] N85-16529
The effect of assumptions about cost element probability distributions on operating and support cost risk analysis [AD-A147553] N85-16576
STATISTICAL TESTS
Neuro-linguistic programming: Eye movements as indicators of representational systems [AD-A147541] N85-16454
STATORS
Development of a Navier-Stokes rotor and stator analysis [AD-A146967] N85-16070
STEADY FLOW
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines [AD-A147092] N85-16073
Existence of slow steady flows of viscoelastic fluids with differential constitutive equations [AD-A147240] N85-16077
STEADY STATE
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine [NASA-TM-86896] N85-15725
STEAM TURBINES
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines [NASA-CR-168222] N85-16300
STEEL STRUCTURES
Corrosion fatigue crack growth rates of weldments in QIN steel [AMTE(M)-R-83003] N85-15770
STEELS
Testing of non-alloyed and low-alloyed steels for their behaviour with respect to intercrystalline stress corrosion cracking [BLL-RISLEY-TR-4546-(9091-9F)] N85-15861
Comparison of the sensitivities of ultrasonic, radiographic and acoustic emission test methods for the examination of a thick weld [BLL-RISLEY-TR-4547-(9091.9F)] N85-16194
A hydrogen partitioning model for hydrogen assisted crack growth [AD-A147385] N85-16214
Verification of the fatigue properties of (small) wind turbines [NLR-MP-83055-U] N85-16311
STEEPEST DESCENT METHOD
Use of shanks transformation for speeding up adaptation process in antenna arrays N85-16029
STEERING
Tracking servo compensator with rate aiding [AD-D011372] N85-15971
STELLAR EVOLUTION
The relevance of QUASAT to the star formation problem N85-16718
STELLAR LUMINOSITY
Some aspects of active galactic nuclei N85-16702
STELLAR MAGNITUDE
Extending magnitude standards to faint stars with a sub-beam prism N85-16124
Sub-beam prism used at the Bosscha Schmidt telescope N85-16125
Astronomers' problems with the calibration of Schmidt plates N85-16126
STELLAR PARALLAX
Astrometric applications of the Mt. Stromlo PDS 1010A --- microdensitometer N85-16136
STELLAR RADIATION
Natural interference phenomena affecting spaceborne receivers [NASA-CR-174256] N85-15796
STELLAR SPECTRA
The Torun measuring system for astronomical spectra N85-16130
Spectrophotometry of cool stars from objective prism spectra N85-16134
STELLAR SPECTROPHOTOMETRY
Astronomical photography 1984 --- conference [ROE-CR-14] N85-16102
The Malin effect in stellar photography N85-16131
Some applications of signal-to-noise in photographic stellar photometry N85-16132
Stellar photographic photometry using a double wedge technique with a focal reducer system N85-16133

Spectrophotometry of cool stars from objective prism spectra N85-16134
STIFFNESS
A review of imperfection sensitivity of stiffened shells [AD-A147311] N85-16213
STIFFNESS MATRIX
An algorithm for assembly of stiffness matrices into a compacted data structure [AD-A146727] N85-16492
STIRLING CYCLE
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program [PB85-100931/GAR] N85-15928
STOCHASTIC PROCESSES
Studies in statistical signal processing [AD-A147130] N85-15959
The Shock and Vibration Digest, volume 16, no. 9 [AD-A146779] N85-16200
Techniques for nonlinear random vibration problems N85-16201
Estimation for a semimartingale regression model using the method of sieves [AD-A146809] N85-16527
Numerical methods and approximation and modelling problems in stochastic control theory [AD-A146927] N85-16533
The symmetry group and exponents of operator stable probability measures [AD-A147187] N85-16568
Limiting distributions of functionals of Markov chains [AD-A147832] N85-16577
Local dependence and point processes of exceedances in stationary sequences [AD-A147859] N85-16578
Robust prediction and interpolation for vector stationary processes, part 3 [AD-A147860] N85-16579
Infinite order autoregressive representations of multivariate stationary stochastic processes [AD-A147863] N85-16580
STOICHIOMETRY
Catalytic oxidation by transition metal ions in zeolites [AD-A146826] N85-15842
STORAGE
Changes in spectral properties of detached leaves [E85-10042] N85-16243
STORAGE BATTERIES
Rechargeable lithium cell [AD-D011302] N85-16304
STORAGE STABILITY
Microspots on spectroscopic plates — astronomical photography N85-16113
STORAGE TANKS
Risks in the transport and storage of liquefied natural gas. Sub-project 5-2: Investigation into building damage [BLL-RISLEY-TR-4608-(9091.9F)] N85-15926
STRAIN GAGE ACCELEROMETERS
Navy operational loads data sources and systems N85-15668
STRAIN GAGES
Structural load measurements on a Northrop NF-5A N85-15667
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Diffusion in metals under high mechanical strain and acceleration [JUEL-1913] N85-15887
The constant current strain gauge bridge [ARL-STRUC-TM-385] N8C-16097
Six-component strain gage block scale 167-6B. Part 1: Calibration, September 1983 [F+W-FO-1699] N85-16143
Residual stresses at small diffusion welds [DE84-014982] N85-16189
Measurement of high temperature strain by the laser-speckle strain gauge [NASA-TM-77751] N85-16207
STRAIN MEASUREMENT
Advanced fatigue monitoring on service aircraft N85-15671
Experiences obtained from service fatigue monitoring exercises N85-15672
Residual stresses at small diffusion welds [DE84-014982] N85-16189
STRAPDOWN INERTIAL GUIDANCE
A discussion of coning errors exhibited by inertial navigation systems [AD-A147846] N85-15708
Flight testing of Litton laser gyro strapdown system LTN-90 for general aviation [DFVLR-MITT-84-16] N85-15709
STRATOCUMULUS CLOUDS
Conditions governing the formation of stratocumulus clouds over the western Atlantic during cold air outbreaks [AD-A146780] N85-16383
STRATOSPHERE
Study of infrared atmospheric emission [AD-A147517] N85-16336
STRENGTH
Fundamentals of microcrack nucleation mechanics [NASA-CR-3851] N85-16195
STRESS (PHYSIOLOGY)
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics [AD-A146851] N85-16423
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
Human factors survey: C-5 pilots [AD-A147106] N85-16477
STRESS (PSYCHOLOGY)
Job and family stress as predictors of pilot health, job satisfaction and performance [AD-A142176] N85-16464
Human factors survey: C-5 pilots [AD-A147106] N85-16477
STRESS ANALYSIS
A study of interply layer effects on the free-edge stress field of angleplied laminates [NASA-TM-86924] N85-15822
STRESS CONCENTRATION
Disc fatigue life predictions for gas turbine engines N85-15743
Fundamentals of microcrack nucleation mechanics [NASA-CR-3851] N85-16195
Stresses in pin-loaded orthotropic plates using photoelasticity [NASA-CR-172498] N85-16204
STRESS CORROSION CRACKING
Corrosion fatigue crack growth rates of weldments in QIN steel [AMTE(M)-R-83003] N85-15770
Testing of non-alloyed and low-alloyed steels for their behaviour with respect to intercrystalline stress corrosion cracking [BLL-RISLEY-TR-4546-(9091-9F)] N85-15861
STRESS CYCLES
Comparison between cycle ergometers with different mechanical braking systems [FOA-C-54058-H1] N85-16193
STRESS INTENSITY FACTORS
Experimental compliance calibration of the NASA Lewis Research Center Mode 2 fatigue specimen [NASA-TM-86908] N85-16205
STRESS MEASUREMENT
Back stress in dislocation creep. Part 1: Basic concepts and measuring techniques [NASA-TM-77773] N85-16206
STRESS WAVES
A study of the stress wave factor technique for the characterization of composite materials [NASA-CR-174219] N85-15821
Laser generation of ultrasonic waveform reconstructions [AD-D011314] N85-16003
STRESSES
Free surface effects on the wake of a flat plate [AD-A146988] N85-16071
Computer program for determining induced stresses and consolidation settlements (CSETT) [AD-A146730] N85-16493
STRIATION
The role of finite parallel length on the stability of barium clouds [AD-A146972] N85-16328
STRONTIUM TITANATES
A study of structural phase transitions using light scattering techniques [AD-A147261] N85-16654
STRUCTURAL ANALYSIS
CF-5 vertical stabilizer flight load survey N85-15673
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
Engine cyclic durability by analysis and material testing N85-15744
Flutter control with unsteady aerodynamic models [AD-A147858] N85-15753
Reduction method for thermal analysis of complex aerospace structures [NASA-TP-2373] N85-16066
A review of imperfection sensitivity of stiffened shells [AD-A147311] N85-16213
STRUCTURAL BASINS
New data on presence of ores in salt dome structures of Dnieper-Donets Basin N85-16234
STRUCTURAL DESIGN
Space Station truss structures and construction considerations [NASA-TM-86338] N85-15796
Design procedures for fiber composite structural components: Panels subjected to combined in-plane loads [NASA-TM-86909] N85-15823
STRUCTURAL DESIGN CRITERIA
Evaluation of operational loads to verify structural design N85-15677
Special problems of Ramjet with solid fuel N85-15815
Solid propellant Ramrockets N85-15816
Damping capacity of multilayer tube during torsion [BLL-M-36011-(5828.4)] N85-16202
Design criteria for small wind turbines [NLR-MP-83054-U] N85-16310
Calculated parameters for the initial part of an accelerator with high-frequency quadrupole focusing [RAE-TRANS-2122] N85-16600
STRUCTURAL FAILURE
TUTOR (CL-41A) tail flight load survey N85-15678
STRUCTURAL MEMBERS
Thermally isolated structural support link [AD-D011349] N85-16176
STRUCTURAL STRAIN
Advanced fatigue monitoring on service aircraft N85-15671
Experiences obtained from service fatigue monitoring exercises N85-15672
CF-5 vertical stabilizer flight load survey N85-15673
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
Flight parameters recording for structure fatigue life monitoring N85-15682
SUBMILLIMETER WAVES
A new free electron laser using a relativistic beam with spiralling electron [AD-D011316] N85-16165
SUBROUTINES
High altitude chemically reacting gas particle mixtures. Volume 2: Program manual for RAMP2 — rocket nozzle and orbital plume flow fields [NASA-CR-171827] N85-15802
On the generation of random variables for radar simulation purposes N85-15947
Some scientific subroutines in LISP [AD-A147889] N85-16515
SUBSONIC SPEED
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing [NASA-TM-85674] N85-15695
SUBSONIC WIND TUNNELS
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel [NASA-TM-86912] N85-15688
Six-component strain gage block scale 167-6B. Part 1: Calibration, September 1983 [F+W-FO-1699] N85-16143
SUBSTRATES
Deposition of titanium nitride coatings by reactive evaporation and electrically activated reactive evaporation [BLL-TRANS-5043-(9091.9F)] N85-15858
Slow wave circuit with shaped dielectric substrate [AD-D011385] N85-15986
Aluminum nitride insulator for 3-5 MIS (Metal-Insulator-Semiconductor) applications [AD-A147842] N85-16662
SULFIDES
Research on electroluminescence in thin film yttrium oxysulfide [AD-A146909] N85-16582
SUN
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry [E85-10040] N85-16241
Spicules and surges [AD-A146785] N85-16727
SUPERCONDUCTIVITY
Fast granular superconducting bolometer [AD-D011332] N85-16093
SUPERCONDUCTORS
Superconducting rotor dynamics [AD-A147176] N85-16000
Forces on neutral atoms due to electromagnetic fields [AD-A146964] N85-16603
SUPERCOOLING
Frazil ice formation [AD-A147425] N85-16279
SUPERCRITICAL PRESSURES
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces [NASA-TM-84589] N85-15697

SUPERCRITICAL WINGS
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing
[NASA-TM-85674] N85-15695
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716
SUPERFLUIDITY
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793
SUPERSONIC COMBUSTION RAMJET ENGINES
Ramjets with supersonic combustion N85-15817
Computational analysis of scramjet dual mode operation
[NASA-CR-174250] N85-16060
SUPERSONIC FLOW
Supersonic nonlinear potential analysis
[NASA-CR-172456] N85-15685
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations
[NASA-CR-174299] N85-15690
A second-order accurate parabolized Navier-Stokes algorithm for internal flows
[NASA-CR-174258] N85-16059
SUPERSONIC JET FLOW
Aeroacoustic data for high Reynolds number supersonic axisymmetric jets
[NASA-TM-86296] N85-16587
SUPPORT SYSTEMS
UH-60A external stores support system fixed provision fairings drag determination
[AD-A147188] N85-15719
Acquisition planning at the Defense Communications Agency
[AD-A146877] N85-16689
SUPPORTS
Thermally isolated structural support link
[AD-D011349] N85-16176
Flexible line support assembly
[AD-D011391] N85-16177
SUPPRESSORS
Reverse wave suppression in unstable ring resonator
[AD-A146825] N85-15952
Development of a 30 GHz/1 kW broadband traveling wave tube with suppression of band edge oscillations
[BMFT-FB-W-84-035] N85-16011
The ac power line protection for an IEEE 587 Class B environment N85-16347
SURFACE PROPERTIES
Test your contacts by measuring their constriction resistance
[BLL-WH-611-(9091.9F)] N85-15978
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099
Theoretical study of laser-induced surface excitations on a grating
[AD-A147855] N85-16172
Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings
[NASA-CR-174274] N85-16296
Preparation and evaluation of ZnSe and ZnS sub X Se sub 1-x epitaxial layers on Ge substrates for applications in surface passivation and heterojunction devices
[AD-A147432] N85-16657
SURFACE REACTIONS
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
SURFACE ROUGHNESS
Optics of solids (surface related) and effect of surface roughness on MOS
[AD-A146883] N85-15996
SURFACE STABILITY
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
SURFACE TEMPERATURE
Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current
[AD-A147910] N85-16282
SURFACE WAVES
Slow surface magnetoplasma waves in oblique magnetic field N85-16034
SURFACES
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
Model robust response surface designs: Scaling 2-level factorials
[AD-A147494] N85-16556
SURGES
Spicules and surges
[AD-A146785] N85-16727
SURVEYS
A survey and evaluation of software quality assurance
[AD-A147552] N85-16510
A complete characterization of triply balanced matrices with applications to survey sampling
[AD-A147083] N85-16542
SURVIVAL
Conditional regression models for transient state survival analysis
[AD-A147872] N85-16563
SWEDEN
Seismicity of southern Sweden
[FOA-C-20543-T1] N85-16340
SWITCHES
Switchable zero order diffraction gratings as light valves
[AD-A147575] N85-16633
SWITCHING
NBS (National Bureau of Standards) switching radiometers
[PB84-235894] N85-16147
SYMMETRY
Downwash in the plane of symmetry of an elliptically loaded wing
[NASA-TP-2414] N85-15693
The symmetry group and exponents of operator stable probability measures
[AD-A147187] N85-16568
SYMPATHETIC NERVOUS SYSTEM
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
SYNAPSES
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
SYNCHROTRON RADIATION
Electron spectrometry experiments with the use of synchrotron radiation
[DE85-001286] N85-16610
SYNOPTIC METEOROLOGY
Synoptical observations of snow depths at Dutch meteorological stations, 1956 - 1977
[KNMI-TR-51] N85-16407
SYNTHESIS (CHEMISTRY)
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride
[AD-D011393] N85-15818
Structural and synthetic organosilicon chemistry
[AD-A147101] N85-15820
Synthesis and properties of Hexachloromolybdates(5) and related species
[AD-A139599] N85-15852
Fluorinated diacrylic esters
[AD-D011328] N85-15889
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902
Syntheeis and characterization of unique liquid crystalline block copolyesters. A proposal for a polymer research center at the Atlanta University
[AD-A147280] N85-15907
New syntheeis of phosphazene polymers
[AD-A147567] N85-15910
SYNTHETIC APERTURE RADAR
The wide-range space radio interferometer N85-16717
SYSTEM EFFECTIVENESS
Reverse wave suppression in unstable ring resonator
[AD-A146825] N85-15952
Analysis of effectiveness of partial optimization of spatial processing systems N85-16031
Nondestructive tests and fracture mechanics investigations in the Component Integrity Research Programme
[BLL-RISLEY-TR-4541-(9091.9F)] N85-16199
Evaluation of the measured energy performance of four solar systems
[AD-A147912] N85-16306
Lunar nuclear power feasibility study
[NASA-CR-171831] N85-16611
SYSTEMS ANALYSIS
The theory of optimal confidence limits for systems reliability with counterexamples for results on optimal confidence limits for series systems
[AD-A147236] N85-16546
SYSTEMS ENGINEERING
United States Air force aircraft modification process: A system dynamics analysis
[AD-A146954] N85-15859
The investigation of tethered satellite system dynamics
[NASA-CR-171278] N85-15772
Future database machine architectures
[AD-A146786] N85-16481
Software test handbook
[AD-A146844] N85-16498
Program visualization: Graphics support for software development
[AD-A146887] N85-16499
Technical performance measurement handbook
[AD-A147314] N85-16575

T

TABLES (DATA)
Safe decompression schedules for caisson workers
[PB85-103812/GAR] N85-16463
TACTICS
Human factors and training research in military organizations and systems
[AD-A146832] N85-16475
TAIL ASSEMBLIES
Experiences obtained from service fatigue monitoring exercises N85-15672
TUTOR (CL-41A) tail flight load survey N85-15678
All-composite Airbus empennage N85-15931
TARGET ACQUISITION
Radar echo enhancement using surface reflections
[AD-A146970] N85-15955
TARGET RECOGNITION
Radar echo enhancement using surface reflections
[AD-A146970] N85-15955
Target detection using microwave irradiances from natural sources: A passive, local and global surveillance system
[NASA-CR-174260] N85-15991
Human factors and training research in military organizations and systems
[AD-A146832] N85-16475
TARGETS
Electro-optical target detection
[AD-D011366] N85-16617
TEAMS
Model of team organization and behavior and team description method
[AD-A147540] N85-16680
TECHNOLOGY ASSESSMENT
Civilian space stations and the US future in space
[OTA-STI-241] N85-15781
Toward a goal-oriented civilian space program N85-15786
Comparative investigation of three commercial radiosonde systems
[KNMI-TR-53] N85-16409
TECHNOLOGY UTILIZATION
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718
Impressions from a study tour in Finland concerning fiber reinforced plastics, June 1984
[FOA-C-20552-D2(E4,F9)] N85-15831
Where to next in astronomical photography? — tabular grain emulsions N85-16114
Use of minicomputers for the formation of hydrological data banks N85-16358
Possibilities and impossibilities of microcomputer systems
[AD-1984-004] N85-16522
Research and technology, 1984 report
[NASA-TM-83096] N85-16730
TECTONICS
General model of earthquakes and the place of warnings in it N85-16232
Model of earthquake mechanism N85-16236
TELECOMMUNICATION
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-018] N85-16014
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-017] N85-16025
Life cycle cost management master plan for the Defense Communications Agency
[AD-A146876] N85-16668
Acquisition planning at the Defense Communications Agency
[AD-A146877] N85-16689
On the complexity of distributed decision problems
[AD-A147174] N85-16674
TELEMETRY
Pulse code modulation telemetry: Properties of various binary modulation types
[AD-A147214] N85-15760
An autonomous roving vehicle for the planet Mars: A summary of over 15 years of research
[RPI-TR-MP-83] N85-16179
TELESCOPES
Helmet mounted telescope
[AD-D011355] N85-16467

TEMPERATURE COMPENSATION
Dynamic polymer pressure transducer with temperature compensation
[AD-D011373] N85-16142
TEMPERATURE CONTROL
Development of a preprototype times wastewater recovery subsystem, addendum
[NASA-CR-171823] N85-16468
TEMPERATURE DEPENDENCE
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium
[AD-A147882] N85-15915
Nondestructive measurement of bulk residual stresses
[AD-A147063] N85-16211
A hydrogen partitioning model for hydrogen assisted crack growth
[AD-A147385] N85-16214
Temperature dependence of the crystal structures of Nylon 11
[AD-A147563] N85-16661
TEMPERATURE DISTRIBUTION
Allowing for the temperature field in the wall thickness of checkerwork in thermal calculation
[BLL-M-36015-(5828.4)] N85-16058
TEMPERATURE EFFECTS
Special features of the deformation of molybdenum at high temperatures
[BLL-M-36027-(5828.4)] N85-15856
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase
[BLL-M-36023-(5828.4)] N85-15873
The relationship between radiation sensitivity and redox equilibria — glass processing variables
[AD-A147216] N85-15906
Effects of low temperatures on the growth and unfrozen water content of an aquatic plant
[AD-A147107] N85-16424
Biochemical evaluation of bodily influence of high and low temperatures N85-16441
TEMPERATURE GRADIENTS
Temperature distortion generator for turboshaft engine testing
[NASA-TM-83748] N85-15858
TEMPERATURE INVERSIONS
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86896] N85-15725
TEMPERATURE MEASUREMENT
Computer program to compute soil thermal conductivity from transient temperature measurements
[PB85-100550] N85-16341
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F
[AD-A147166] N85-16392
TEMPERATURE MEASURING INSTRUMENTS
External cavity diode laser sensor
[AD-D011341] N85-16152
TEMPERATURE PROFILES
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS)
[NASA-TP-2425] N85-16351
TEMPORAL DISTRIBUTION
Specifics of dynamics of brain biopotentials under the influence of complex audible communicative signals N85-16440
TEMPORAL RESOLUTION
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies — QUASAT N85-16723
TENNESSEE
Image variance and spatial structure in remotely sensed scenes — South Dakota, California, Missouri, Kentucky, Louisiana, Tennessee, District of Columbia, and Oregon N85-16265
TENSILE STRENGTH
Strength and aging behaviour of soft soldered joints
[BLL-T6385/BG/WH800/84] N85-15862
On heat-treatable copper-chromium alloy, 1
[NASA-TM-77753] N85-15879
Mechanical property data 7050-t736511 alloy
[AD-A147365] N85-15882
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909
TENSILE TESTS
Special features of the deformation of molybdenum at high temperatures
[BLL-M-36027-(5828.4)] N85-15856
TENSOR ANALYSIS
Trust region methods for minimization
[AD-A147073] N85-16540
TERMINAL BALLISTICS
Nondestructive deceleration of a rocket sled — target penetration tests
[FOA-C-20549-D3] N85-15771
TERNARY SYSTEMS
Transport properties and distribution functions in 3-5 semiconductors
[AD-A147525] N85-16660
TERRAIN
On the long range propagation of sound over irregular terrain
[NASA-CR-3862] N85-16589
TERRESTRIAL RADIATION
Deciduous forest radiation regimes: Effects of forest structure, phenology and Earth-Sun geometry upon their spatial, temporal and spectral variability
[AD-A146804] N85-16327
TEST EQUIPMENT
A machine for weight-lift testing
[AD-A146816] N85-16182
Random pattern tracking acceleration tolerance tester
[AD-D011404] N85-16459
TEST FACILITIES
The Western Aeronautical Test Range of NASA Ames Research Center
[NASA-TM-85924] N85-15756
Facility safety study
[NASA-CR-174280] N85-15759
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949
National Bureau of Standards passive solar test facility: Instrumentation and site handbook
[PB85-100451/GAR] N85-16148
TEST FIRING
A metallographic investigation of rotating bands for 7.5 cm artillery projectiles
[FOA-C-20551-D2] N85-15888
TEST RANGES
The Western Aeronautical Test Range of NASA Ames Research Center
[NASA-TM-85924] N85-15756
TETHERED SATELLITES
The investigation of tethered satellite system dynamics
[NASA-CR-171278] N85-15772
TEXTURES
Texture classification using autoregressive filtering N85-16254
THEOREMS
A non-commutative quasi subadditive ergodic theorem
[AD-A146810] N85-16581
THEORETICAL PHYSICS
Testing theories of superluminal motion — QUASAT N85-16714
THERMAL ANALYSIS
Reduction method for thermal analysis of complex aerospace structures
[NASA-TP-2373] N85-16066
THERMAL BATTERIES
Synthesis and properties of Hexachloromolybdates(5) and related species
[AD-A139599] N85-15852
THERMAL CONDUCTIVITY
Test your contacts by measuring their constriction resistance
[BLL-WH-611-(9091.9F)] N85-15978
Analysis of the heating process of a body in a melt
[BLL-M-36014-(5828.4)] N85-16057
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment
[AD-A147006] N85-16210
Computer program to compute soil thermal conductivity from transient temperature measurements
[PB85-100550] N85-16341
THERMAL CONTROL COATINGS
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
Evaluation of colorless polyimide film for thermal control coating applications
[NASA-TM-86341] N85-15894
THERMAL CYCLING TESTS
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
Ion implantation and laser processing of III-V compound semiconductors with applications to the fabrication of microwave devices
[AD-A146846] N85-16651
THERMAL DECOMPOSITION
Description and operation of a thermal decomposition unit-gas chromatographic system
[PB84-246362] N85-16146
THERMAL DIFFUSION
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas
[AD-A147481] N85-16170
THERMAL DIFFUSIVITY
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas
[AD-A147481] N85-16170
THERMAL ENERGY
Deputy Minister discusses plans for geothermal power N85-16313
THERMAL FATIGUE
Cumulative damage modeling of fatigue crack growth N85-15741
Engine cyclic durability by analysis and material testing N85-15744
Thermal-mechanical fatigue crack growth in Inconel X-750
[NASA-CR-174740] N85-15877
THERMAL INSULATION
Description of the insulation system for the Langley 0.3-Meter Transonic Cryogenic Tunnel
[NASA-TM-86274] N85-15755
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures
[PB85-100949/GAR] N85-15918
THERMAL PROTECTION
Integral boost, heat protection, port covers and transition N85-15813
THERMAL RADIATION
The adsorption of CO and oxygen on Cu layers on a W(110) surface
[AD-A147345] N85-15847
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program
[AD-A146771] N85-15951
Self-generated magnetic fields and thermal flux inhibition
[AD-A147405] N85-16166
THERMAL STRESSES
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
Monitoring engine thermal stresses N85-15735
THERMOCHEMISTRY
Laminar heat-transfer distributions on biconics at incidence in hypersonic-hypervelocity flows
[NASA-TP-2213] N85-16065
THERMOCOUPLES
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture
[NASA-TM-86898] N85-16096
THERMODYNAMIC PROPERTIES
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures
[PB85-100949/GAR] N85-15918
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment
[AD-A147006] N85-16210
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
Temperature dependence of the crystal structures of Nylon 11
[AD-A147563] N85-16661
Computer program for calculation of complex chemical equilibrium compositions and applications. Supplement 1: Transport properties
[NASA-TM-86885] N85-16663
THERMODYNAMICS
Interaction between chromium oxide and carbon
[BLL-M-36002-(5828.4)] N85-15867
Target detection using microwave irradiances from natural sources: A passive, local and global surveillance system
[NASA-CR-174260] N85-15991
THERMOELASTICITY
New aspects of thermoelastic contact
[AD-A147554] N85-16217
THERMOELECTRIC GENERATORS
Development of a preprototype times wastewater recovery subsystem, addendum
[NASA-CR-171823] N85-16468
THERMOMAGNETIC EFFECTS
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36028-(5828.4)] N85-15855
THERMOMECHANICAL TREATMENT
Back stress in dislocation creep. Part 1: Basic concepts and measuring techniques
[NASA-TM-77773] N85-16206

THERMOMETERS
Digital thermometer with linearizer on slide wire N85-16049

THERMOPHYSICAL PROPERTIES
National Bureau of Standards passive solar test facility: Instrumentation and site handbook [PB85-100451/GAR] N85-16148
Thermophysical property testing using transient techniques [AD-A147085] N85-16864

THERMOREGULATION
Effects of body mass and morphology on thermal responses in water [AD-A147558] N85-16455

THICK FILMS
The replacement of precious metal thick film inks using conductive polymer technology. Phase 1: Feasibility study [AD-A147814] N85-15913

THICK WALLS
Allowing for the temperature field in the wall thickness of checkerwork in thermal calculation [BLL-M-36015-(5828.4)] N85-16058

THICKNESS
Method for non contacting gauging of the wall thickness of tubes by backscattering radiation [OEFZS-4274] N85-16144

THIN FILMS
Evaluation of colorless polyimide film for thermal control coating applications [NASA-TM-86341] N85-15894
Sputtering in thin film technology for optics — laser systems N85-15948
Fast granular superconducting bolometer [AD-D011332] N85-16093
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture [NASA-TM-86898] N85-16096
Research on electroluminescence in thin film yttrium oxysulfide [AD-A146909] N85-16582

THREADS
Improvement of gas-tightness of OTTG and TBO-5 threaded pipe couplings [BLL-M-35993-(5828.4)] N85-16175

THREE DIMENSIONAL BOUNDARY LAYER
On the instability of a 3-dimensional attachment line boundary layer: Weakly nonlinear theory and a numerical approach [NASA-CR-172504] N85-16063

THRESHOLDS
Analysis of threshold effects during estimation of arrival time of optical signals N85-16030

THRUST CHAMBERS
Extended performance technology study 30-cm thruster [NASA-CR-168259] N85-15806

THRUST CONTROL
Aircraft thrust control scheme for terrain following system [AD-D011387] N85-15711

THUNDERSTORMS
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer [AD-A147438] N85-15965

TIDE POWERED GENERATORS
Progress in developing tidal electric power plants reported N85-16314

TIGHTNESS
Improvement of gas-tightness of OTTG and TBO-5 threaded pipe couplings [BLL-M-35993-(5828.4)] N85-16175

TILT ROTOR AIRCRAFT
Speed benefits of tilt-rotor designs for LHX [NASA-CR-166437] N85-15717

TILTING ROTORS
Speed benefits of tilt-rotor designs for LHX [NASA-CR-166437] N85-15717

TIME
Microseism level, time variations at Turkmen seismic stations studied N85-16231
Efficient computation of optimal time for transaction processing in a database system [AD-A147568] N85-16693

TIME DEPENDENCE
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations [AD-A147463] N85-16554
Effect of integration time on precision of absorbances measured with a diode array UV-VIS spectrophotometer [AD-A146952] N85-16824

TIME MEASUREMENT
Effects of aircraft and flight parameters on energy-efficient profile descents in time-based metered traffic [NASA-CR-172338-ADD] N85-15706

TIME SERIES ANALYSIS
Electronics research at the University of Texas at Austin [AD-A146900] N85-15998
Autoregressive spectral estimation for two dimensional time series N85-16258
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
A factor analysis for time series [AD-A147495] N85-16574

TIME SHARING
Passive maser using timesharing for control of the cavity and control of the oscillator on the line of stimulated emission [AD-D011326] N85-16151

TIN
Float zone experiments in space [NASA-CR-171284] N85-15766
Investigations into the improvement of processing of Bolivian tin ores [BMFT-FB-T-84-184] N85-15807

TIN OXIDES
Process for preparation of crosslinked poly(tri-n-butyltin) methacrylate with simultaneous particle size reduction [AD-D011313] N85-15905

TIP SPEED
Shutdown characteristics of the Mod-O wind turbine with aileron controls [NASA-TM-86918] N85-16299

TITANIUM
Evaluation of the alkaline peroxide pre-bond surface treatment for titanium [AD-A147352] N85-15881

TITANIUM ALLOYS
Disc fatigue life predictions for gas turbine engines N85-15743
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties [AD-A147504] N85-15829
Study of residual stresses introduced into TA6ZrD (685) cylinders by quenching [BLL-PNR-90240-(8019.3153)] N85-15859
Pulsed electric discharge laser technology. Electron beam window foil material [AD-A147488] N85-16171

TITANIUM NITRIDES
Deposition of titanium nitride coatings by reactive evaporation and electrically activated reactive evaporation [BLL-TRANS-5043-(9091.9F)] N85-15858

TOKAMAK DEVICES
Experimental results on Tokamak beta limits from ISX-B [DE84-015372] N85-16644

TOLERANCES (MECHANICS)
Array sidelobes, error tolerance, gain, and beamwidth [AD-A147004] N85-15956
Tolerance synthesis of multilayer radome walls N85-16041

TOLERANCES (PHYSIOLOGY)
A crew exposure study. Volume 1: Offshore [AD-A146884] N85-16449
Effects of restricted water intake on performance in a cold environment [AD-A146904] N85-16450

TOPOGRAPHY
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica [E85-10051] N85-16247

TOROIDS
The evaluation of a deformable diffraction grating for a stigmatic EUV spectrohelliometer [NASA-CR-174248] N85-16621

TORSION
Damping capacity of multilayer tube during torsion [BLL-M-36011-(5828.4)] N85-16202

TORSIONAL VIBRATION
Damping capacity of multilayer tube during torsion [BLL-M-36011-(5828.4)] N85-16202
Measurement and evaluation of the loading of shafts by torsional vibrations N85-16222

TOUGHNESS
Imide modified epoxy matrix resins [NASA-CR-174695] N85-15892

TOXIC HAZARDS
A biological sensor for the detection of toxicants [AD-D011304] N85-16141
Toxic hazards research [AD-A147857] N85-16425

TOXICITY
Toxic hazards research [AD-A147857] N85-16425
A crew exposure study. Volume 1: Offshore [AD-A146884] N85-16449

TOXICITY AND SAFETY HAZARD
Immobilization of toxic waste by embedding it in bitumen [OEFZS-4277] N85-16322

TOXICOLOGY
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-015] N85-16416

TOXINS AND ANTITOXINS
Induction of immunity to toxins with anti-idiotypic antibody [AD-A146793] N85-16445

TRACKING (POSITION)
Stereo Electro-optical Tracking System (SETS) [NASA-CR-172471] N85-16096
Automatic camera tracking for remote manipulators [DE85-001897] N85-16187
An interactive FORTRAN program for determining reliability of pseudo-range geodetic point positioning using the global positioning system [AD-A147133] N85-16275
Random pattern tracking acceleration tolerance tester [AD-D011404] N85-16459
JPL Robotics Laboratory computer vision software library [NASA-CR-174272] N85-16491
Ocean acoustics [AD-A147062] N85-16591

TRACKING FILTERS
Tristatic tracking filter used by the multistatic measurement system [AD-A146885] N85-15789

TRAINING AIRCRAFT
Analysis of the flow field about a T-45 using PANAIR [AD-A146811] N85-15899
Can the Aggressors continue to be effective in the F-5E? [AD-A146861] N85-16465

TRAINING ANALYSIS
An analysis of the technical training of enlisted minuteman missile maintenance personnel [AD-A147078] N85-15775

TRAINING EVALUATION
An analysis of the technical training of enlisted minuteman missile maintenance personnel [AD-A147078] N85-15775

TRANSDUCERS
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade [NASA-TM-86914] N85-15689
Digital thermometer with linearizer on slide wire N85-16049

TRANSFORMATIONS (MATHEMATICS)
New technology high efficiency and high stability color motion video compression system [AD-A147523] N85-15988
Use of shanks transformation for speeding up adaptation process in antenna arrays N85-16029

TRANSIENT RESPONSE
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345

TRANSISTOR AMPLIFIERS
Dual-gate MESFET variable gain constant output power amplifier [AD-D011334] N85-15982

TRANSMISSION
Multiple scattering effects on transmission through the atmosphere [AD-A147527] N85-15969
Low-loss flexible dielectric waveguide for millimeter-wave transmission and its application to devices [AD-A147848] N85-16006

TRANSMISSION LINES
Holographic directional coupler for fiber optic systems [AD-D011365] N85-15939
Multiwavelength bidirectional coupler-decouplers [AD-A147009] N85-16625

TRANSMISSION LOSS
Analytic models for radiation induced loss in optical fibers 2: A physical model [AD-A147442] N85-16632

TRANSMITTANCE
Changes in spectral properties of detached leaves [E85-10042] N85-16243

TRANSMITTERS
Lightweight, broadband Rayleigh wave transducer [AD-D011345] N85-16584

TRANSONIC FLOW
A comparative study of the nonuniqueness problem of the potential equation
[NASA-TP-2385] N85-15694
An exploratory study of finite difference grids for transonic unsteady aerodynamics
[NASA-TM-84583] N85-15696
A method for solving the inverse problem of transonic cascade flow
[AD-A146739] N85-15698
TRANSONIC WIND TUNNELS
Description of the insulation system for the Langley 0.3-Meter Transonic Cryogenic Tunnel
[NASA-TM-86274] N85-15755
TRANSPARENCE
Evaluation of colorless polyimide film for thermal control coating applications
[NASA-TM-86341] N85-15894
Demonstration of transparent solar array module design
[NASA-CR-174257] N85-16302
TRANSPONDERS
Investigation of the ice dynamics in the marginal ice zone
[AD-A146729] N85-16411
TRANSPORT AIRCRAFT
Ground-effect analysis of a jet transport airplane
[NASA-TM-85920] N85-15687
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718
Design and test requirements for development of today's engines N85-15737
TRANSPORT PROPERTIES
Transport properties and distribution functions in 3-5 semiconductors
[AD-A147525] N85-16660
Computer program for calculation of complex chemical equilibrium compositions and applications. Supplement 1: Transport properties
[NASA-TM-86885] N85-16663
TRANSPORT THEORY
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228
The (20)Ne interaction in extended matter
[NASA-TM-86312] N85-16728
TRANSPORTATION
Risks in the transport and storage of liquefied natural gas. Sub-project 5-2: Investigation into building damage
[BLL-RISLEY-TR-4606-(9091.9F)] N85-15926
TRANSPORTATION NETWORKS
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica
[E85-10051] N85-16247
TRANSVERSE WAVES
Quantitative acoustic emission techniques
[AERE-R-11262] N85-16203
TRAPS
Forces on neutral atoms due to electromagnetic fields
[AD-A146984] N85-16603
TRAVELING IONOSPHERIC DISTURBANCES
Dispersion properties of moving ionospheric perturbations N85-16036
TRAVELING WAVE TUBES
Development of a 30 GHz/1 kW broadband traveling wave tube with suppression of band edge oscillations
[BMFT-FB-W-84-035] N85-16011
TRAVELING WAVES
On the asymptotic analysis of travelling shocks and phase boundaries in elastic bars
[AD-A147239] N85-16076
TREES (PLANTS)
Nonparametric analysis of Minnesota spruce and aspen tree data and LANDSAT data N85-16253
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry
[DE85-001272] N85-16406
TROPICAL METEOROLOGY
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
The Amazon and climate N85-16376
TROPICAL REGIONS
Razrezy program research in the tropical Atlantic N85-16229
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach — Costa Rica
[E85-10051] N85-16247
TROPOSPHERE
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F
[AD-A147166] N85-16392
TRUSSES
Space Station truss structures and construction considerations
[NASA-TM-86338] N85-15796
TUNABLE LASERS
Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens
[AD-D011311] N85-16163
A new free electron laser using a relativistic beam with spiralling electron
[AD-D011318] N85-16165
TUNGSTEN
The adsorption of CO and oxygen on Cu layers on a W(110) surface
[AD-A147345] N85-15847
TURBINE BLADES
Problems and possibilities for life extension in gas turbine components N85-15742
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747
Verification of life prediction through component testing N85-15748
Repair welding and brazing procedures for turbine components and investigation of the brazing behavior of thin filler foils
[MTU-TB-908/84] N85-16190
TURBINE ENGINES
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
Improvement of the corrosion resistance of turbine engine bearings
[AD-A147430] N85-15731
Engine Cyclic Durability by Analysis and Testing
[AGARD-CP-368] N85-15733
TURBINE WHEELS
Comparison between the properties of conventional wrought and powder metallurgical alloys for turbine disc applications N85-15739
Problems and possibilities for life extension in gas turbine components N85-15742
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
TURBOCOMPRESSORS
Current problems in turbomachinery fluid dynamics
[AD-A147127] N85-16074
TURBOFAN ENGINES
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86896] N85-15725
TURBOFANS
CFM 56-2. Oligocyclic fatigue of the turbofan disk: Dimensionning and tests for verification and improvements N85-15750
TURBOMACHINE BLADES
An improved computer model for prediction of axial gas turbine performance losses
[NASA-CR-174246] N85-15724
TURBOMACHINERY
Development of a Navier-Stokes rotor and stator analysis
[AD-A146967] N85-16070
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
TURBOPROP AIRCRAFT
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716
TURBOSHAFTS
Temperature distortion generator for turboshaft engine testing
[NASA-TM-83748] N85-15658
TURBULENCE
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
The structure of dilute combusting sprays
[NASA-CR-174838] N85-15728
Dynamical characteristics of weak turbulence
[AD-A147186] N85-16075
Turbulence measurement interferometer apparatus
[AD-D011377] N85-16156
TURBULENT FLOW
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
Studies of the wall shear stress in a turbulent pulsating pipe flow
[AD-A146772] N85-16068
Turbulence measurement interferometer apparatus
[AD-D011377] N85-16156
Ionospheric turbulence: Interchange instabilities and chaotic fluid behavior
[AD-A147810] N85-16337
TWO DIMENSIONAL FLOW
Unsteady flow characteristics in the near-wake of a two-dimensional obstacle
[NASA-TM-77762] N85-15684
Laminar flow over a backward-facing step
[AD-A147469] N85-16084
TWO PHASE FLOW
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701
TWO REFLECTOR ANTENNAS
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna
[NASA-CR-174268] N85-15944

U

U.S.S.R.
Automated Lavina collects data on snow N85-16224
New data on presence of ores in salt dome structures of Dnieper-Donets Basin N85-16234
Deep structure of Western Siberia N85-16235
Deputy Minister discusses plans for geothermal power N85-16313
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-027] N85-16426
UH-60A HELICOPTER
UH-60A external stores support system fixed provision fairings drag determination
[AD-A147188] N85-15719
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
ULTRALOW TEMPERATURES
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures
[PB85-100949/GAR] N85-15918
ULTRASONIC RADIATION
Laser generation of ultrasonic waveform reconstructions
[AD-D011314] N85-16003
Superlattice ultrasonic wave generator
[AD-D011363] N85-16585
ULTRASONIC SCANNERS
Ultrasonic measurements, X-ray photographs and image processing
[BLL-RISLEY-TR-4586-(9091.9F)] N85-16583
ULTRASONIC TESTS
Nondestructive inspection: Improved capabilities of technicians
[AD-A147388] N85-16196
Ultrasonic analysis of spherical composite test specimens
[DE85-001591] N85-16197
Use of the analytic signal in ultrasonic imaging
[DE84-016843] N85-16598
ULTRASONICS
Nondestructive measurement of bulk residual stresses
[AD-A147063] N85-16211
Optical fibers with reduced pressure sensitivity to high frequency acoustic field
[AD-D011306] N85-16627
ULTRAVIOLET LASERS
Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens
[AD-D011311] N85-16163
ULTRAVIOLET SPECTROPHOTOMETERS
Effect of integration time on precision of absorbances measured with a diode array UV-VIS spectrophotometer
[AD-A146952] N85-16624
UNDERWATER ACOUSTICS
Ocean acoustics
[AD-A147062] N85-16591
Arctic marine acoustics
[AD-A147492] N85-16594
Current and current shear effects in the parabolic approximation for underwater sound channels
[AD-A147833] N85-16597
UNDERWATER ENGINEERING
Evaluation of the Kerie Cable thermal arc cutting equipment
[AD-A147813] N85-16186
UNDERWATER RESOURCES
Maritime prospecting, mining discussed N85-16226
UNIQUENESS
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560

UNIQUENESS THEOREM
Existence and non-uniqueness of similarity solutions of a boundary layer problem
[NASA-CR-172503] N85-16064
UNITED KINGDOM
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F
[AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F
[AD-A146915] N85-16386
UNITED STATES
The evolution of civilian in-space infrastructure, i.e., space station concepts in the United States N85-15788
International involvement in a civilian space station program N85-15789
Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements N85-15790
Title 2: National Commission on Space (Public Law 98-361) N85-15791
Financing considerations and Federal budget impacts N85-15792
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684
UNSTEADY FLOW
Unsteady flow characteristics in the near-wake of a two-dimensional obstacle
[NASA-TM-77762] N85-15684
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies
[AD-A146964] N85-16069
UPPER ATMOSPHERE
Upper Atmosphere Research Satellite (UARS) trade analysis
[NASA-CR-175269] N85-15774
USER MANUALS (COMPUTER PROGRAMS)
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual — rocket nozzle and orbital plume flow fields
[NASA-CR-171826] N85-15803
Interactive Signal Analysis Software (ISAS). User's manual
[AD-A146999] N85-16485
RATFOR user's guide version 2.0
[NASA-CR-166601] N85-16490
NYU Ada/Ed user's guide: Version 1.4 for VAX/VMS systems
[AD-A146759] N85-16495
NOISEMAP 4.4 computer program update, operator's manual, addendum 1
[AD-A147091] N85-16503
FORTRAN version of the quantitative energy-dispersive electron beam X-ray analysis program FRAME C
[PB84-240936] N85-16519
USER REQUIREMENTS
Commerce Laboratory: Mission analysis payload integration study
[NASA-CR-171296] N85-15764
Results of principal NASA studies on space station uses and functional requirements N85-15787
What do we want: Increased speed, resolution, contrast or DOE? — astronomical photography N85-16115
Climatological information and water resources N85-16367
Mental models and cooperative problem solving with expert systems
[AD-A147843] N85-16479
A study of the relationship between user attitudes and the success of the MAJCOM and AFRCE work information management system
[AD-A146956] N85-16671
UTAH
Detecting agricultural to urban land use change from multi-temporal MSS digital data — Salt Lake County, Utah
[E85-10049] N85-16245
An integrated remote sensing approach for identifying ecological range sites — parker mountain
[E85-10050] N85-16246
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Hill AFB, Utah, parts A-F
[AD-A147184] N85-16395
UTILIZATION
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16694

V

VACCINES
Induction of immunity to toxins with anti-idiotypic antibody
[AD-A146793] N85-16445
VACUUM APPARATUS
High temperature ultra-high vacuum infrared window seal
[AD-D011333] N85-15890
Cryogenic glass-to-metal seal
[AD-D011370] N85-15911
VACUUM CHAMBERS
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174286] N85-16639
VAPOR DEPOSITION
Alloys and method of making
[AD-D011337] N85-15874
Method of preparing single crystalline cubic silicon carbide layers
[AD-D011305] N85-16653
Preparation and evaluation of ZnSe and ZnS sub X Se sub 1-x epitaxial layers on Ge substrates for applications in surface passivation and heterojunction devices
[AD-A147432] N85-16657
VAPOR PHASE EPITAXY
Preparation and evaluation of ZnSe and ZnS sub X Se sub 1-x epitaxial layers on Ge substrates for applications in surface passivation and heterojunction devices
[AD-A147432] N85-16657
VAPORIZERS
Nonlinear control model of an H2O steam reactor
[DFVLR-FB-84-30] N85-16192
VARIANCE (STATISTICS)
Geostatistics for resource and reserve estimation
[PB85-105781/GAR] N85-16286
VARIATIONAL PRINCIPLES
Surface reconstruction preserving discontinuities
[AD-A146741] N85-16526
VECTOR ANALYSIS
Techniques for vector quantization
[AD-A147052] N85-16539
Belief structures
[AD-A147526] N85-16575
Robust prediction and interpolation for vector stationary processes, part 3
[AD-A147980] N85-16579
VECTORS (MATHEMATICS)
Techniques for vector quantization
[AD-A147052] N85-16539
VEGETATION
An integrated remote sensing approach for identifying ecological range sites — parker mountain
[E85-10050] N85-16246
VEGETATION GROWTH
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry
[DE85-001272] N85-16406
Effects of low temperatures on the growth and unfrozen water content of an aquatic plant
[AD-A147107] N85-16424
Controlled ecological life support system higher plant flight experiments
[NASA-CR-177323] N85-16471
VELOCITY
Speed benefits of tilt-rotor designs for LHX
[NASA-CR-166437] N85-15717
Free surface effects on the wake of a flat plate
[AD-A146988] N85-16071
Nondestructive measurement of bulk residual stresses
[AD-A147063] N85-16211
A low perturbation electron injector for cyclic accelerators
[AD-D011312] N85-16604
VELOCITY MEASUREMENT
Axisymmetric electromagnetic field influence on the characteristic velocity of an arc-jet
[NASA-TM-77475] N85-15942
VERBAL COMMUNICATION
Neuro-linguistic programming: Eye movements as indicators of representational systems
[AD-A147541] N85-16454
VERTICAL TAKEOFF AIRCRAFT
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update
[AD-A146966] N85-15661
VERY LONG BASE INTERFEROMETRY
QUASAT: A VLBI observatory in space — conferences
[ESA-SP-213] N85-16700
The galaxy scene and QUASAT — VLBI satellite N85-16703
The QUASAT mission: An overview N85-16704
Some prospects of space VLBI N85-16705
QUASAT: Technical aspects of the proposed mission — VLBI satellite N85-16706
A study on the imaging potential of QUASAT — spaceborne VLBI N85-16707
Potential affiliate stations to work with the EVN — European VLBI Network; QUASAT N85-16708
Correlator and data processing requirements for QUASAT N85-16709
Limitation of VLBI angular resolution N85-16710
Processing system for space VLBI N85-16711
Testing theories of superluminal motion — QUASAT N85-16714
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715
Very Long Base Interferometry (VLBI) in space and X-ray observations of compact sources in active galactic nuclei N85-16716
The wide-range space radio interferometer N85-16717
The relevance of QUASAT to the star formation problem N85-16718
Galactic OH and H2O masers — QUASAT project N85-16719
Water masers and distance measurements: The impact of QUASAT N85-16721
A short note on the high precision navigation of QUASAT N85-16722
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies — QUASAT N85-16723
VESTIBULES
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422
VETERINARY MEDICINE
USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-015] N85-16416
VIBRATION
F-8 refueling boom ground vibration test
[NASA-TM-84914] N85-15713
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590
VIBRATION DAMPING
F-8 refueling boom ground vibration test
[NASA-TM-84914] N85-15713
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715
Damping capacity of multilayer tube during torsion
[BLL-M-36011-(5828.4)] N85-16202
VIBRATION TESTS
F-8 refueling boom ground vibration test
[NASA-TM-84914] N85-15713
VIBRATORY LOADS
Damping capacity of multilayer tube during torsion
[BLL-M-36011-(5828.4)] N85-16202
Measurement and evaluation of the loading of shafts by torsional vibrations N85-16222
VIDEO SIGNALS
New technology high efficiency and high stability color motion video compression system
[AD-A147523] N85-15968
Analysis of threshold effects during estimation of arrival time of optical signals N85-16030
VIEWING
Improved radiographic viewing system
[AD-A147587] N85-16456
VINYL POLYMERS
Dynamic polymer pressure transducer with temperature compensation
[AD-D011373] N85-16142
VINYL RADICAL
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850
VIRIAL COEFFICIENTS
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
VISCOELASTICITY
Existence of slow steady flows of viscoelastic fluids with differential constitutive equations
[AD-A147240] N85-16077

VISCOPLASTICITY
Life prediction at high temperature under multiaxial loading N85-15745
VISCOSITY
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium [AD-A147888] N85-15915
Viscosity solutions of Hamilton-Jacobi equations at the boundary [AD-A147444] N85-16553
On existence and uniqueness of solutions of Hamilton-Jacobi equations [AD-A147597] N85-16580
VISCOUS FLOW
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel [NASA-TM-86912] N85-15688
VISCOUS FLUIDS
Sedimentation of two arbitrarily oriented spheroids in a viscous fluid [AD-A147303] N85-16082
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks [NASA-CR-3864] N85-16590
VISIBILITY
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F [AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F [AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F [AD-A146915] N85-16386
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F [AD-A146916] N85-16387
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters [AD-A147574] N85-16404
VISIBLE INFRARED SPIN SCAN RADIOMETER
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS) [NASA-TP-2425] N85-16351
VISUAL FLIGHT RULES
National airspace review: Airport radar service area operational confirmation report [DOT/FAA/AT-84/2] N85-15707
VISUAL PERCEPTION
Central regulation of sensory flow in human visual system N85-16435
Lateral specifics of visual perception N85-16436
Testing changes in visual function due to orbital environment [AD-A147259] N85-16453
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa) [AD-A147890] N85-16458
VISUAL STIMULI
Lateral specifics of visual perception N85-16436
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
Random pattern tracking acceleration tolerance tester [AD-D011404] N85-16459
VOCODERS
Literature review of voice recognition and generation technology for Army helicopter applications [AD-A146878] N85-15954
VOICE COMMUNICATION
VOTAN V5000 speech recognition system performance test report [AD-A146726] N85-15950
Literature review of voice recognition and generation technology for Army helicopter applications [AD-A146878] N85-15954
VOICE CONTROL
Voice command weapons launching system [AD-D011378] N85-15940
VOLCANOES
Satellite photographs suggest arctic volcano N85-16239
VOLTAGE CONTROLLED OSCILLATORS
Analog to digital converter [AD-D011338] N85-15963
VORTICES
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations [NASA-CR-174299] N85-15690
Numerical studies of interacting vortices [NASA-TM-86325] N85-16062
Current problems in turbomachinery fluid dynamics [AD-A147127] N85-16074
Free-surface boundary layer and the origin of bow vortices [AD-A147427] N85-16083
Laminar flow over a backward-facing step [AD-A147469] N85-16084
Interactions between mean flow and finite-amplitude mesoscale eddies in a barotropic ocean [AD-A147249] N85-16413

W

WALL FLOW
Studies of the wall shear stress in a turbulent pulsating pipe flow [AD-A146772] N85-16068
WALL TEMPERATURE
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture [NASA-TM-86898] N85-16096
WALLS
Tolerance synthesis of multilayer radome walls N85-16041
WARFARE
Can the Aggressors continue to be effective in the F-5E? [AD-A146861] N85-16465
WARNING SYSTEMS
A biological sensor for the detection of toxicants [AD-D011304] N85-16141
Battery control and fault detection method [AD-D011384] N85-16307
WASHINGTON
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F [AD-A146914] N85-16385
WASPALOY
Possibilities for a more accurate life prediction of components — gas turbine disks N85-16198
WASTE DISPOSAL
Description and operation of a thermal decomposition unit-gas chromatographic system [PB84-246362] N85-16146
WASTE TREATMENT
Immobilization of toxic waste by embedding it in bitumen [OEFZS-4277] N85-16322
WASTE UTILIZATION
Development of a preprototype times wastewater recovery subsystem, addendum [NASA-CR-171823] N85-16468
WATER BALANCE
The water balance and climate — Amazon region N85-16370
WATER FLOW
Coso Monitoring Program, January 1981 through December 1983 [AD-A147894] N85-16338
WATER IMMERSION
Effects of body mass and morphology on thermal responses in water [AD-A147558] N85-16455
WATER INJECTION
Geothermal wells drilled in Transcarpathians N85-16315
WATER MASERS
Galactic OH and H2O masers — QUASAT project N85-16719
Water maser outburst N85-16720
Water masers and distance measurements: The impact of QUASAT N85-16721
WATER POLLUTION
Fate and disposition of trichloroethylene in surface soils [AD-A147918] N85-16321
WATER QUALITY
In-lake water quality management for Lake Eureka: Highlights of third year (1983) operation [PB85-104149/GAR] N85-16289
Climate and water quality N85-16368
Development of a preprototype times wastewater recovery subsystem, addendum [NASA-CR-171823] N85-16468
WATER RECLAMATION
Development of a preprototype times wastewater recovery subsystem, addendum [NASA-CR-171823] N85-16468
WATER RESOURCES
Climatological information and water resources N85-16367
Water and climate, study of one case N85-16369
The water balance and climate — Amazon region N85-16370
WATER TEMPERATURE
Forecasting water temperature decline and freeze-up in rivers [AD-A147068] N85-16274
Coso Monitoring Program, January 1981 through December 1983 [AD-A147894] N85-16338
WATER TREATMENT
In-lake water quality management for Lake Eureka: Highlights of third year (1983) operation [PB85-104149/GAR] N85-16289
Development of a preprototype times wastewater recovery subsystem, addendum [NASA-CR-171823] N85-16468
WATER VAPOR
Nonlinear control model of an H2O steam reactor [DFVLR-FB-84-30] N85-16192
Continuum absorption by H2O in the 700-1200 cm(-1) and 2400-280 cm(-1) windows [AD-A147391] N85-16334
WAVE DIFFRACTION
Optimization piezoelectric transducer width of acousto-optical devices N85-16024
WAVE DISPERSION
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
Dispersion properties of moving ionospheric perturbations N85-16036
WAVE DRAG
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations [NASA-CR-174299] N85-15690
WAVE GENERATION
Laser generation of ultrasonic waveform reconstructions [AD-D011314] N85-16003
Superlattice ultrasonic wave generator [AD-D011363] N85-16585
WAVE PROPAGATION
Reverse wave suppression in unstable ring resonator [AD-A146825] N85-15952
A quasi-optical method for measuring the complex permittivity of materials [AD-A147483] N85-15966
Multiple scattering effects on transmission through the atmosphere [AD-A147527] N85-15969
Slow surface magnetoplasma waves in oblique magnetic field N85-16034
Transformation of electromagnetic waves in plasma with randomly-heterogeneous magnetic field N85-16039
Quantitative acoustic emission techniques [AERE-R-11262] N85-16203
Nonlinear waves in a rod. Results for incompressible elastic materials [AD-A147485] N85-16216
Nonlinear wave propagation study [AD-A147011] N85-16329
Short period guided waves over oceanic and continental paths [AD-A147053] N85-16331
On the long range propagation of sound over irregular terrain [NASA-CR-3862] N85-16589
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD) [NASA-CR-174286] N85-16639
WAVE REFLECTION
Reflection theorems for some anisotropic media N85-16038
WAVEFORMS
Laser generation of ultrasonic waveform reconstructions [AD-D011314] N85-16003
WAVEGUIDE FILTERS
Dual mode directionally coupled band reject filter apparatus [AD-D011359] N85-15984
WAVEGUIDE TUNERS
Micro-waveguide transformers of coherent optical signals N85-16022
WAVEGUIDES
MMIC devices for active phased array antennas [NASA-CR-174281] N85-15943
NBS (National Bureau of Standards) and WR62 and WR90 reference noise standards [PB84-235704] N85-15977
Investigation of planar waveguides and components for millimeter-wave integrated circuits [AD-A147380] N85-16005

Low-loss flexible dielectric waveguide for millimeter-wave transmission and its application to devices
[AD-A147848] N85-16006
Acoustic transducers for fast reactor instrumentation
[BLL-RISLEY-TR-4979-(9091.9F)] N85-16091
Upgrading flexible infrared waveguides
[AD-A146763] N85-16160

WAVELENGTH DIVISION MULTIPLEXING
Multiwavelength bidirectional coupler-decouplers
[AD-A147009] N85-16625

WEAPON SYSTEMS
ILIR task of digital recoil travel measurement system
[AD-A147102] N85-16140
An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement
[AD-A147496] N85-16678
Estimating wartime support resource requirements. Statistical and related policy issues
[AD-A147923] N85-16685

WEAR
Mechanical aspects of high temperature coatings N85-15749
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099

WEAR INHIBITORS
Deposition of titanium nitride coatings by reactive evaporation and electrically activated reactive evaporation
[BLL-TRANS-5043-(9091.9F)] N85-15858

WEATHER
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F
[AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F
[AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F
[AD-A146915] N85-16386
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F
[AD-A146918] N85-16389
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Lousiana, parts A-F
[AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F
[AD-A147166] N85-16392
Limited surface observations climatic summary (LISOCS). Hohenfels, AAF, West Germany
[AD-A147167] N85-16393
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Offutt AFB, Nebraska, parts A-F
[AD-A147183] N85-16394
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Hill AFB, Utah, parts A-F
[AD-A147184] N85-16395
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396

WEATHER FORECASTING
NOAA (National Oceanic and Atmospheric Administration) Aircraft Satellite Data Link (ASDL)
[PB84-243773] N85-15976
Automated Lavina collects data on snow N85-16224
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
The 500 millibar sign frequency teleconnection charts: Winter
[PB85-106276/GAR] N85-16410

WEATHER MODIFICATION
The management of atmospheric resources in food production N85-16362

WEATHER STATIONS
Automated Lavina collects data on snow N85-16224

WEBS (SHEETS)
Aircraft barricade
[AD-D011316] N85-15761

WEIGHT (MASS)
A machine for weight-lift testing
[AD-A146816] N85-16182

WEIGHT INDICATORS
Rain rate meter
[AD-D011381] N85-16342

WEIGHTLESSNESS
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427
Testing changes in visual function due to orbital environment
[AD-A147259] N85-16453
Controlled ecological life support system higher plant flight experiments
[NASA-CR-177323] N85-16471

WELD STRENGTH
Corrosion fatigue crack growth rates of weldments in QIN steel
[AMTE(M)-R-83003] N85-15770
Repair welding and brazing procedures for turbine components and investigation of the brazing behavior of thin filler foils
[MTU-TB-908/84] N85-16190

WELD TESTS
Corrosion fatigue crack growth rates of weldments in QIN steel
[AMTE(M)-R-83003] N85-15770
Comparative investigation of testing methods to determine hot crack susceptibility during welding
[BAM-ERP-2415] N85-16218

WELDED JOINTS
Residual stresses at small diffusion welds
[DE84-014982] N85-16189
Comparison of the sensitivities of ultrasonic, radiographic and acoustic emission test methods for the examination of a thick weld
[BLL-RISLEY-TR-4547-(9091.9F)] N85-16194

WELDING
Comparative investigation of testing methods to determine hot crack susceptibility during welding
[BAM-ERP-2415] N85-16218

WELLS
Geothermal wells drilled in Transcarpathians N85-16315

WEST GERMANY
BDLI memorandum on the future of space flight in the Federal Republic of Germany
[NASA-TM-77624] N85-15765
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F
[AD-A147166] N85-16392
Limited surface observations climatic summary (LISOCS). Hohenfels, AAF, West Germany
[AD-A147167] N85-16393

WETTABILITY
Preliminary evaluation of a liquid belt radiator for space applications
[NASA-CR-174807] N85-15804
Contact angle and surface tension measurements of a five-ring polyphenyl ether
[NASA-TM-86927] N85-15897

WHEAT
Growth/reflectance model interface for wheat and corresponding model
[E85-10058] N85-16269

WHEATSTONE BRIDGES
The constant current strain gauge bridge
[ARL-STRUC-TM-385] N85-16097

WHEELS
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184

WHITE LIGHT HOLOGRAPHY
White-light optical information processing and holography
[AD-A146938] N85-16138

WIND (METEOROLOGY)
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea
[AD-A147204] N85-16397
Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16398

WIND PROFILES
Atmospheric environment for Space Shuttle (STS-41G) launch
[NASA-TM-86486] N85-16320

WIND TUNNEL APPARATUS
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT)
[NASA-TM-86919] N85-15757
The NASA Altitude Wind Tunnel (AWT): Its role in advanced icing research and development
[NASA-TM-86920] N85-15758
Six-component strain gage block scale 167-6B. Part 1: Calibration, September 1983
[F+W-FO-1899] N85-16143

WIND TUNNEL MODELS
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699
Experiences with the use of a side-strut model support system for high angles of attack in the Trinsonik wind tunnel TMK
[DFVLR-MITT-84-09] N85-15763

WIND TUNNEL TESTS
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6
[NASA-TM-86345] N85-15657
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel
[NASA-TM-86912] N85-15688
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing
[NASA-TM-85674] N85-15695
The UH-1H helicopter icing flight test program: An overview
[NASA-TM-86925] N85-15702
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT)
[NASA-TM-86919] N85-15757
The NASA Altitude Wind Tunnel (AWT): Its role in advanced icing research and development
[NASA-TM-86920] N85-15758
Stereo Electro-optical Tracking System (SETS)
[NASA-CR-172471] N85-16098

WIND TUNNELS
Ultrasound instrumentation for the 7 inch Mach seven tunnel
[NASA-CR-174277] N85-16586

WIND TURBINES
Shutdown characteristics of the Mod-O wind turbine with aileron controls
[NASA-TM-86918] N85-16299
Development of large wind energy power generation system
[NASA-TM-77779] N85-16301
Design criteria for small wind turbines
[NLR-MP-83054-U] N85-16310
Verification of the fatigue properties of (small) wind turbines
[NLR-MP-83055-U] N85-16311
Detection of low frequency impulsive noise from large wind turbine generators
[NASA-CR-172511] N85-16588

WIND VELOCITY MEASUREMENT
Wind sheltering correction — anemometry
[KNMI-TR-52] N85-16408

WINDPOWER UTILIZATION
Development of large wind energy power generation system
[NASA-TM-77779] N85-16301

WINDPOWERED GENERATORS
Development of large wind energy power generation system
[NASA-TM-77779] N85-16301

WING LOADING
Structural load measurements on a Northrop NF-5A N85-15667
Downwash in the plane of symmetry of an elliptically loaded wing
[NASA-TP-2414] N85-15693

WING NACELLE CONFIGURATIONS
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716

WING PROFILES
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718

WING SPAN
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15718

WING TIPS
Integrated technology wing study (oral presentation)
[NASA-CR-169497] N85-15716
WINGS
Reduction method for thermal analysis of complex aerospace structures
[NASA-TP-2373] N85-16066
WINTER
The 500 millibar sign frequency teleconnection charts: Winter
[PB85-106276/GAR] N85-16410
WORD PROCESSING
Document interchange format
[PB84-217033] N85-16517
WORKING FLUIDS
Preliminary evaluation of a liquid belt radiator for space applications
[NASA-CR-174807] N85-15804
WORLD METEOROLOGICAL ORGANIZATION
Review of climate problems in Latin America and the Caribbean N85-16354
The potential contributions of the World Climate Program (WCP) to the economies of developing countries N85-16371

X

X RAY ABSORPTION
Measurement of soft X-ray absorption spectra with a fluorescent ion chamber detector
[AD-A142213] N85-15838
X RAY ANALYSIS
FORTRAN version of the quantitative energy-dispersive electron beam X-ray analysis program FRAME C
[PB84-240936] N85-16519
X RAY ASTRONOMY
Very Long Base Interferometry (VLBI) in space and X-ray observations of compact sources in active galactic nuclei N85-16716
X RAY DIFFRACTION
Gallium arsenide compounds tested nondestructively with X-rays N85-15934
X-ray and backscattering analysis of ion implantation phenomena in GaAs and related compounds
[AD-A147449] N85-16659
Temperature dependence of the crystal structures of Nylon 11
[AD-A147563] N85-16661
X RAY IMAGERY
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment — X-ray films N85-16104
X RAY SPECTROSCOPY
Measurement of soft X-ray absorption spectra with a fluorescent ion chamber detector
[AD-A142213] N85-15838
X RAYS
Improved radiographic viewing system
[AD-A147587] N85-16456

Y

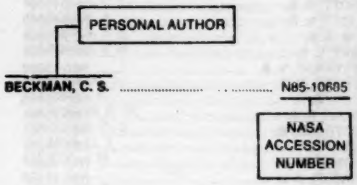
YAG LASERS
Design and testing of a refractive laser beam homogenizer
[AD-A146997] N85-16162
YIELD
Crop yield forecasting N85-16360
YTTERBIUM
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
YTTRIUM COMPOUNDS
Research on electroluminescence in thin film yttrium oxysulfide
[AD-A146909] N85-16582

Z

ZEEMAN EFFECT
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing
[AD-A146827] N85-16623
ZEOLITES
Catalytic oxidation by transition metal ions in zeolites
[AD-A146828] N85-15842
ZINC
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283
ZINC ALLOYS
Application of the diffraction model to amorphous magnesium zinc alloys
[AD-A147369] N85-15883
ZIRCONIUM NITRIDES
Corrosion study on zirconium refractory coatings. 1: Oxidation of zirconium nitride coatings by oxygen
[BLL-RISLEY-TR-5044-(9091.9F)] N85-15857

PERSONAL AUTHOR INDEX

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The NASA accession number denotes the number by which the citation is identified.

A

ABBE, D. N85-16848
ABBOTT, J. M. N85-15757
ABBOTT, R. D. N85-16563
ABBOTT, W. Y. N85-15719
ABRAHAM-SHRAUNER, B. W. N85-16658
N85-16660
ABRAMOVICH, Y. I. N85-16031
ACKERET, J. R. N85-16275
ACKERMANN, M. R. N85-15997
ACOSTA, W. A. N85-15727
ADAM, E. C. N85-15722
ADAMS, J. V. N85-15717
ADAMS, N. N85-16333
ADAMSON, L. F. N85-16457
ADDAMIANO, A. N85-16653
ADELMAN, L. N85-16479
ADLER, F. L. N85-16668
N85-16669
ADLEY, M. D. N85-16277
AGNO, J. G. N85-15928
AGRE, P. E. N85-16513
AKCHURIN, E. A. N85-16019
AKGUN, M. N85-16212
AKSENOV, L. B. N85-16524
ALBERSHEIM, S. R. N85-16593
ALBINI, F. A. N85-16341
ALLCOCK, H. R. N85-15902
ALLEN, C. W. N85-15850
ALT, R. L. N85-16334
ALVES, F. P. N85-16371
AMADOR, J. A. N85-16378
AMDUR, A. M. N85-15873
AMIRKHANOV, A. V. N85-16045
ANDERSON, A. B. N85-15844
ANDERSON, B. N85-15771
ANDERSON, R. C. N85-16100
ANDERSSON, K. N85-15720
ANDRACCHIO, C. A. N85-16096
ANDRADE, F. J. N85-16372
ANDREEV, P. I. N85-15864
ANDREJANOV, V. V. N85-16717
ANDROSHIN, A. N85-16225
ANNEMA, K. N85-16409
ANTONUZZI, A. P. N85-16009
ANUCHIN, O. N. N85-16028
APPLEGATE, C. A. N85-15661
ARBUCKLE, B. R. N85-16289
ARCONE, S. A. N85-15958
ARKHAROV, V. I. N85-16645
ARKHONTOV, L. B. N85-16021
ARMSTRONG, R. A. N85-16641
ARNONE, R. A. N85-16281
N85-16282
ARTEMOV, V. N. N85-16417
ARVIDSON, J. M. N85-15918
ASHLEY, J. L. N85-15762
ASTLEFORD, W. J. N85-16449
ASTY, M. N85-16194
ATHANS, M. N85-16674
ATLAS, D. N85-16273
AUBRUN, J. N. N85-15795
AUME, N. M. N85-16182
AUSLANDER, D. N85-16472
AUSTIN, P. N85-15902
AVERNER, M. M. N85-16469
AYEDI, H. F. N85-15857
AZBUKINA, N. A. N85-16027
AZNABAEV, D. A. N85-15832

B

BAARD, J. H. N85-15853
BABCOCK, P. N85-16472
BABUSKA, I. N85-16531
N85-16535
BAILEY, A. R. N85-15714
BAILEY, R. N85-15659
BALBERDE, A. N85-15717
BALDOCCHI, D. D. N85-16327
BALKANSKI, M. N85-16652
BALKE, H. N85-15677
BALLATO, A. N85-16596
BANKS, H. N85-15907
BANNISTER, T. C. N85-15764
BAO-AN, Y. N85-16107
BARANES, L. N85-15681
BARBER, J. R. N85-16217
BARKALAYA, A. I. N85-16441
BARLOW, J. W. N85-15903
BARNES, J. A. N85-16305
BARNETT, P. D. N85-16089
BARROS, V. N85-16375
BARTH, R. L. N85-15658
BASS, H. E. N85-16592
BASSO, E. N85-16369
BATES, C., JR. N85-16467
BATTLES, F. P. N85-16332
BATTS, G. W. N85-16320
BAUER, M. E. N85-16241
N85-16242
BAUKUS, J. P. N85-16655
BAUM, H. N85-16089
BAUMAN, W. N85-16514
BAWDEN, A. N85-16513
BAY, L. S. N85-16449
BAYBAKOV, V. I. N85-16034
BEAN, J. N85-16688
BEARDSMORE, D. J. N85-16324
BEATTIE, J. R. N85-15806
BEATTIE, K. R. N85-16595
BEESON, J. L. N85-16184
BEHRENS, P. N85-16470
BEKEFI, G. N85-16154
BELCASTRO, C. M. N85-16345
BELL, Z. W. N85-16598
BELLYUSTIN, N. S. N85-16039
BELOUSOV, I. A. N85-16049
BELYATSKAYA, I. S. N85-15855
BENCUYA, S. N85-15964
BENDOT, J. G. N85-15811
BENIZRI, R. N85-15836
BENNETT, R. M. N85-15698
BENTZ, R. R. N85-16187
BERENSTEIN, C. A. N85-16267
BERGH, U. N85-16193
BERGHAUS, D. G. N85-16189
BERMAN, P. R. N85-16602
BERNARD, J. M. N85-15952
BERRY, J. N85-15799
BERTHEL, R. G. N85-16402
BESSER, H. L. N85-15816
BESSON, J. N85-15857
N85-15858
BETHIN, J. N85-15880
BETZOLD, V. A. N85-16140
BEUSCHER, D. B. N85-16289
BHARTIYA, V. N85-15707
BICHER, K. I. N85-16431
BIEHL, L. L. N85-16241
N85-16243
BIERMANN, P. N85-16716
BIESIADNY, T. J. N85-15658
BIGELOW, J. H. N85-16667
BILLIG, F. S. N85-15817
BINDER, M. N85-15845
BINDFORD, T. O. N85-16178
BIRAC, C. N85-16194
BIRDSEY, R. A. N85-16290
BIRMAN, J. L. N85-15996
BIS, R. F. N85-16305
BISHOP, W. S. N85-16307
BISS, M. S. N85-16177
BJORNSTAD, S. C. N85-16338
BLACKBURN, J. F. N85-16482
BLAHA, B. J. N85-15756
BLAIR, D. E. N85-16694
BLAKE, M. L. N85-16727
BLAKENBERG, P. N85-16092
BLAND, T. L. N85-16595
BLAUGHER, R. D. N85-16000
BLEISTEIN, N. N85-16541
BLINKOV, I. V. N85-15871
BLOKHNIN, A. N85-16314
BLONSKY, P. M. N85-15902
BLUMBERG, P. N. N85-16699
BODSON, F. N85-16194
BOEHM-DAVIS, D. A. N85-16511
BOERSMA, D. N85-16409
BOGOYAVLENSKII, K. N. N85-16524
BOKOVIKOV, A. K. N85-16418
BOLDMAN, D. R. N85-15699
BOLTON, S. N85-16707
BOMBERGER, H. B. N85-15884
BONDAREV, L. A. N85-16023
BONESS, K. D. N85-16149
BONSER, W. N85-15985
BOOTH, R. S. N85-16719
BORCHERT, B. N85-16196
BORKAT, F. R. N85-16452
BORMANN, S. N85-16092
BORTSOV, Y. A. N85-16053
BORTZMEYER, H. N85-15789
BOSCHER, J. N85-16285
BOSE, B. K. N85-16488
BOSHELL, J. F. N85-16360
BOSOSLOVSKII, V. N. N85-16645
BOTA, K. B. N85-15907
BOWERS, A. H. N85-15987
BOX, G. E. P. N85-16574
BOYD, R. W. N85-16630
BRADLEY, K. R. N85-16162
BRADLEY, M. E. N85-16443
BRADLEY, W. P. N85-16512
BRATCHIKOV, S. G. N85-15873
BRAUDE, V. B. N85-16020
BRAUN, H. J. N85-15974
BREITKOPF, G. E. N85-15734
BRIDGES, W. B. N85-16006
BRIGHT, R. P. N85-15950
BRINZA, V. N. N85-16202
BRISCOE, M. G. N85-16412
N85-16414
BROADWELL, J. E. N85-16158
BROMBERG, J. L. N85-16161
BROQUA, R. N85-16389
BROSEY, W. D. N85-16197
BROWN, D. A. N85-16184
BROWN, G. G. N85-16558
BROWN, G. P. N85-16499
BROWN, H. E. N85-15940
BRUCE, J. P. N85-16368
BRUECK, M. T. N85-16123
BRYAN, J. B. N85-16188
BUCARO, J. A. N85-16827
BUCHHOLZ, S. E. N85-16305
BUCKANIN, R. M. N85-15719
BUCKLEY, D. H. N85-15893
N85-15896
BUDAGYAN, I. F. N85-16022
N85-16023
BUDELL, R. N85-16129
BUDOV, V. M. N85-16058
BUFFUM, D. H. N85-15889
BUGGELE, A. E. N85-15889
BURSHAND, T. A. N85-15863

BUKHTOYAROV, O. I. N85-16599
BUONTEMPO, V. N85-15949
BUR, A. J. N85-16142
BURCH, D. E. N85-16334
BURCHAM, F. W., JR. N85-15729
BURGOS, J. J. N85-16359
BURK, A. A., JR. N85-15995
BURKE, B. F. N85-16704
N85-16707
N85-16715
BURKE, K. C. N85-16323
BURKE, W. R. N85-16700
BURKETT, B. E. N85-15971
BURKOV, I. A. N85-16017
BURNS, W. K. N85-16629
BUSH, H. G. N85-15796
BUSZ-PEUCKERT, G. N85-15835
N85-15837
BUTCHER, J. N85-16486
BUTOWSKY, H. A. N85-15768
BUZZARD, R. J. N85-16205
BYKOV, S. Y. N85-15872
BYRD, R. H. N85-16538

C

CADEK, J. N85-16206
CAILLET, M. N85-15857
CAILLETAUD, G. N85-15745
CALCOTE, H. F. N85-15841
CAMPBELL, D. P. N85-16293
CAMPBELL, P. M. N85-15775
CANFIELD, K. J. N85-16509
CANNON, R. D. N85-16115
N85-16121
CANNON, R. H., JR. N85-16178
CANTRELL, B. H. N85-15955
N85-15967
CANTU, E. N85-16442
CANZIANI, O. F. N85-16379
CARLING, R. T. N85-16499
CARRENO, V. A. N85-16344
CARROLL, R. J. N85-16563
CASSON, W. H. N85-16643
CATRON, P. W. N85-16443
CAZIN, P. N85-15814
CEBECI, T. N85-16069
N85-16087
CELMINS, A. K. R. N85-16507
CHABOCHE, J. L. N85-15745
CHAKAR, A. N85-15826
CHANIS, C. C. N85-15822
N85-15823
CHAN, L. C. N85-15908
CHANCELLOR, J. N85-15960
CHANDRASEKARAN, B. N85-16690
CHANG, B. J. N85-16292
CHANG, L. L. N85-16585
CHANG, S. N85-15753
CHAPIN, C. C. N85-16184
CHEN, S. C. N85-16165
CHERNICK, M. R. N85-15966
CHERNYAK, V. S. N85-16032
CHERNYSHEV, N. M. N85-16235
CHESTUKHIN, V. V. N85-16439
CHIHKARA, R. S. N85-16260
CHINO, J. J. N85-16002
CHIPASHVILI, D. G. N85-16108
CHISTYAKOV, V. A. N85-16429
CHITSOMBOON, T. N85-16059
CHIZHOV, G. V. N85-16175
CHODZKO, R. A. N85-15952
CHRIST, K. A. N85-15954
CHUBB, C. R. N85-16155
CITERLEY, R. L. N85-16213
CLARK, J. N85-16290
CLARK, O. M. N85-16347
CLARK, R. L. N85-16383
CO, C. M. N85-16195
COCHRAN, R. W. N85-15795
COFFER, J. G. N85-15952
COHEN, J. K. N85-16541
COLE, J. H. N85-16627
COMER, M. R. N85-16620
COMMINOU, M. N85-16217
COOLEY, R. C. N85-16270
COOPER, C. L. N85-16464
COPPA, L. V. N85-16266
CORLEY, D. M. N85-16069
CORNAND, J. P. N85-15681
CORRIGAN, R. D. N85-16299
COSKREN, R. J. N85-15827
COSTOGUE, E. N. N85-16295
COTE, P. J. N85-15863
COURVOISIER, P. N85-15836
COYTE, E. N85-16109
CRANDALL, M. G. N85-16553
N85-16557
N85-16560
CRISPIN, B. N85-15810
CRIST, S. D. N85-16342
CROOMES, S. D. N85-15796
CROSSMAN, A. A. N85-16165
CROWE, G. E. N85-15799
CRUM, L. A. N85-16592
CUDDIHY, E. F. N85-16296
CULP, R. L. N85-15674
CUMMINGS, R. J. N85-15700
CUNNINGHAM, R. N85-16491
CURRY, R. E. N85-15687
CUSHMAN-ROISIN, B. N85-16413

D

DALY, S. F. N85-16274
DANIELS, D. S. N85-16486
DANILOV, A. A. N85-16021
DANILOV, B. G. N85-16031
DAPKO, V. N. N85-16034
DARBY, E. R. N85-15976
DASILVAFAGUNDESFILHO, E. N85-16248
DATLOWE, D. W. N85-15767
DATTA, S. N. N85-16562
DAUDET, H. C. N85-16300
DAUGHTRY, C. S. T. N85-16242
N85-16243
DAVENHALL, A. C. N85-16127
DAVIES, G. A. O. N85-15703
DAVINO, R. M. N85-16485
DAVIS, D. N85-16689
DAVIS, J. L. N85-16280
DAVIS, L. S. N85-16261
DAVIS, P. B. N85-16305
DAVIS, R. W. N85-16090
DAWE, J. A. N85-16109
DAYWITT, W. C. N85-15977
N85-16147
DEALMEIDA, F. C. N85-16362
DEBERGH, C. N85-16725
DEBOLD, F. C. N85-16305
DEFURIA, A. J. N85-16171
DEHNER, G. F. N85-16468
DEIDRICH, J. H. N85-15757
DEJARNETTE, F. R. N85-15706
DELAVIGNE, M. N85-15679
DELBOS, M. N85-16583
DEMPSEY, B. J. N85-15760
DENG, Z. N85-15914
DENIS, S. N85-15859
DENISOV, N. G. N85-16036
DENISOVA, N. A. N85-16047
DENTE, G. C. N85-16618
DERESKA, S. P. N85-15717
DESANTO, J. A. N85-16541
DEUSTER, G. N85-16199
DEVEGT, C. N85-16135
DEVRIES, C. P. N85-16137
DHAWAN, V. N85-16707
DIEMANN, E. N85-15963
DIGIOVANNIANTONIC, P. N85-15761
DILLARD, H. E. N85-15722
DIMARIA, D. J. N85-16646
DISZ, T. E. N85-16673
DIXON, S. C. N85-15691
DOBREA, I. N. N85-16382
DOBROLYUBOV, A. I. N85-16236
DOI, T. N85-15876
DOLIDZE, R. V. N85-16050
DOMIN, J. S. N85-16668
N85-16669
DORBANDT, J. N85-15776
DOSSANTOS, J. M. N85-16374
DOW, D. D. N85-16264
DOWNES, D. N85-16716
DOWNING, R. G. N85-16294
DRAGOSAVIC, M. N85-15926
DRAKE, J. F. N85-16328
DRAPER, N. R. N85-16569
DRESS, D. A. N85-15755
DRISCOLL, M. M. N85-16010
DUBBERLY, M. J. N85-15668
DUBROVIN, V. F. N85-16023
DUCHAMP, D. J. N85-16486
DUDKIN, V. P. N85-16052
DUEMMLER, R. N85-16129
DUEN, F. K. N85-15686
DUGRANRUT, J. D. N85-15976
DUKE, J. C., JR. N85-15821
DYMENT, A. N85-15684
DYSON, H. D. N85-15966
DZYUBA, O. N85-16239

E

EASTERBROOK, C. C. N85-16349
EDDY, A. N85-16377
EDEL, P. O. N85-16463
EDEN, J. G. N85-16163
EDMUNDS, T. M. N85-15735
EDWARDS, D. N85-15992
EINHORN, H. J. N85-16572
EKBOM, L. N85-15888
ELLIOT, D. H. N85-16288
ELLIOTT, D. G. N85-15701
ELLIOTT, K. R. N85-16662
ELLIS, A. B. N85-15995
EMBRY, L. B. N85-16685
EMELYANOV, V. A. N85-15868
EMERSON, D. T. N85-16718
EMERY, M. H. N85-16166
ENGLAR, R. J. N85-15661
ENGSTROEM, B. N85-16145
ENNIS, P. J. N85-16221
EPHREMIDES, A. N85-15957
EPPINGER, J. L. N85-16486
EPSTEIN, A. H. N85-16074
ERDMAN, C. A. N85-16611
ESCH, H. N85-15763
ESKESEN, G. J. S. N85-16677
ESSENWANGER, O. M. N85-16401
ETTEMA, R. N85-16279
ETTERS, R. D. N85-16649
EVANS, D. E. N85-16443
EVANS, W. J. N85-15743

F

FABIAN, A. C. N85-16702
FAETH, F. M. N85-15728
FAIRFIELD, D. H. N85-16726
FAKHFAKH, T. N85-16174
FALKO, G. L. N85-16046
FALTA, G. N85-16615
FANELLI, S. N85-15947
FARMER, M. C. N85-16446
FARMER, T. E. N85-15751
FARR, E. N85-15779
FAYZRAKHMANOV, V. R. N85-16045
FEDDER, J. A. N85-16335
FEDORCHENKO, A. M. N85-16046
FEDOROV, N. N. N85-16035
FEDOROV, S. M. N85-16045
FEINGOLD, E. N85-16698
FERBER, R. R. N85-16295
FERET, J. M. N85-16291
FERNANDEZ, E. N85-16470
FERNELIUS, N. C. N85-16162
FILATOV, K. V. N85-16018
FILHO, L. G. M. N85-16354
FILIMONOV, Y. P. N85-16057
FINKEL, A. N85-16085
N85-16086
FINKELNBURG, W. N85-15835
N85-15837
FISCHER, G. N85-16012
FISCUS, I. B. N85-16146
FITZGERALD, K. N85-15804
FITZGERALD, W. J. N85-15950
FLEMING, W. H. N85-16533
FLYNN, D. J. N85-15708
FLYNN, E. T. N85-16443
FOERSTNER, W. N85-16263
FOLEY, M. E. N85-16455
FOLTYN, E. P. N85-16274
FONG, R. N85-16126
FORESTER, D. W. N85-15874
FORT, E. F. N85-16699
FORTER, S. A. N85-15704
FOTH, J. N85-16220
FOX, M. M. N85-15774
FRANCESCONI, R. P. N85-16423
FRANCIS, C. L. N85-16140
FRANK, A. H. N85-16151
FREDERICK, D. K. N85-16179
FREEMAN, D. B. N85-16576
FRERE, M. N85-16361
FRESCO, J. N85-15737
FREVERT, E. N85-16144
FREY, P. N85-15760
FROLOV, V. N. N85-16427
FU, L. S. N85-16195
FUENTES, P. N85-16380
FUJITA, T. N85-16298
FUSCHETTO, A. N85-15794

G

GABER, B. P. N85-16446
GABRIELYANTS, G. A. N85-16235
GAINES, E. E. N85-15767
GALATI, G. N85-15947
GALLAGHER, J. J. N85-16293
GALLAGHER, R. M. N85-15775
GALLO, K. P. N85-16242
GALSWORTHY, J. C. N85-15770
GANNON, J. N85-16500
GAO, M. N85-16214
GARDNER, C. E. N85-16187
GARDNER, J. N85-15899
GARDNER, J. E. N85-15891
GARDNER, J. H. N85-16166
N85-16638
GARG, V. K. N85-16079
GARMIRE, E. N85-16180
GARRISON, P. W. N85-15701
GAZENKO, O. G. N85-16422
GEARIN, C. J. N85-15717
GEARY, J. M. N85-16139
N85-16156
GEBHART, J. N85-16092
GENCO, L. V. N85-16453
GENNUSO, D. N85-15942
GEORGE, E. W. N85-16456
GEORGE, N. N85-16630
GEORGE, T. F. N85-16172
GEOSLING, C. E. N85-15890
GERBER, H. E. N85-15839
GERSHO, A. N85-16539
GERZANICH, V. V. N85-16433
GEUDOU, J. Y. N85-15740
GEYER, E. H. N85-16133
GIALLORENZI, T. G. N85-16094
N85-16152
GIBBONS, J. F. N85-16651
GIEDT, R. R. N85-15952
GILL, W. N. N85-15766
GILLETT, F. C. N85-16724
GILLETTE, G. N85-16688
GILLHAM, J. K. N85-15908
GILMAN, S. N85-15845
GIULIANI, J. F. N85-15891
GIULIANI, J. L., JR. N85-16210
GLADUE, R. N85-16470
GLANS, A. C. N85-16340
GLANTZ, M. H. N85-16373
GLASGOW, D. G. N85-15905
GLASS, E. N85-16011
GLOWINSKI, R. N85-16554
GNOFFO, P. A. N85-16065
GODWIN, J. G. N85-16126
GOETZBERGER, A. N85-16308
N85-16309
GOGINENI, S. N85-15960
GOLDSMITH, E. L. N85-15812
GOLDSTEIN, A. S. N85-15976
GOLDSTEIN, M. N85-16575
GOLEV, V. K. N85-16132
GOLIK, L. L. N85-16054
GOLITSYN, M. V. N85-16317
GOLODOV, S. M. N85-15867
GOLUB, C. N. N85-16346
GOMER, R. N85-15847
GONNERMAN, V. J. N85-15660
GOOD, A. R. N85-16113
GORALNICK, N. S. N85-16619
GORBUNOVA, L. D. N85-16419
GORDON, J. D. N85-16072
GORDON, S. N85-16663
GORDON, S. L. N85-16461
GORDON, T. L. N85-15844
GORNEY, D. J. N85-16405
GORNY, R. N85-15807
GOTTLIEB, J. J. N85-16061
GOUKER, M. A. N85-16293
GOURLAY, G. N85-16113
GOUWENS, C. N85-15926
GOVADA, A. K. N85-15821
GRAFF, H. N85-16617
GRAHAM, J. M. N85-16424
GRAINGER, F. S. N85-15676
GRANDINE, T. A. N85-16551
GRANIER, J. N85-15858
GRANT, R. W. N85-16662
GREBENNIKOVA, N. V. N85-16436
GREEGOR, R. B. N85-15838
GREEN, E. K. N85-16286
GREEN, N. L. N85-16283
GREITZER, E. M. N85-16074
GRIFFIN, C. J. N85-16647
GRIFFIN, T. J. N85-15951
GRIFFITH, J. R. N85-15889
GRIGORYANTS, V. V. N85-16023
GRIGORYEV, G. I. N85-16036
GROENEWEG, J. F. N85-15757
GROSHART, E. N85-16348
GROSSI, M. D. N85-16095
GRUBRIN, I. V. N85-16029
GRUENLING, H. W. N85-15749
GRUN, J. N85-16638
GRYSON, P. N85-15684
GUCKENHEIMER, J. N85-16075
GUENTHER, J. N85-15722
GUI, W. N85-16535
GUIBERT, A. N85-15750
GUNST, R. F. N85-16259
GUOQIANG, T. N85-16722
GURKINA, L. A. N85-16031
GURVICH, A. S. N85-16040
GURVITS, L. I. N85-16717
GUSEMAN, L. F., JR. N85-16251
N85-16257
GVOZDEV, S. V. N85-16439

H

HACKNEY, J. D. N85-16482
HADLEY, B. W. N85-16122
HAGGERTY, S. E. N85-16272
HAGIN, F. G. N85-16541
HALE, L. G. N85-16582
HALFORD, G. R. N85-15744
HALL, D. G. N85-16630
HALL, E. C. N85-15704
HALL, P. N85-16063
HALLENBECK, J. M. N85-16443
HAMADEH, I. M. N85-15847
HAMLET, D. N85-16500
N85-16504
HAMMER, J. N85-15692
HAMMOND, E. C., JR. N85-16101
HAN, K. S. N85-16168
HANNA, M. M. N85-16118
N85-16119
HANRATTY, T. J. N85-16068
HANSEN, J. P. N85-15937
HARDING, A. K. N85-16729
HARPER-TERVET, J. N85-15681
HARRIS, B. N85-16546
HARRIS, C. N85-16534
HARRIS, G. L. N85-15999
HARRISON, M. P. N85-16303
HARVEY, T. M. N85-15851
HASSAM, A. B. N85-16337
HASTIE, T. N85-16573
HAU, C. C. N85-15766
HAWKYARD, A. N85-16704
HAWRYLO, F. Z. N85-16157
HAYASHI, E. N85-16150
HAYNES, R. N85-15999
HEDAYAT, A. N85-16542
HEDLUND, S. D. N85-16684
HEIDLER, K. N85-16309
HEIDNER, R. F., III N85-16167
HEIKKILA, W. J. N85-16636
HEINMAN, A. S. N85-16111
HEINS, A. E., JR. N85-15811
HELGODT, R. N85-15975
HELMLE, L. C. N85-16490
HENDRIKS, T. P. M. N85-16319
HENNEKE, E. G., II N85-15821
HERBST, M. J. N85-16638
HERMAN, G. N85-15750
HEROT, C. F. N85-16499
HERRING, T. A. N85-16280
HEYDORN, R. P. N85-16252
HIBLER, W. D., III N85-16278
HIDAYAT, B. N85-16125
HILL, C. K. N85-16320
HILL, J. R. N85-16256
HILL, R. J. N85-15748
HINKLEY, D. V. N85-16256
HINSHELWOOD, D. D. N85-16642
HIPPENSTEELE, S. A. N85-16096
HIROTA, K. N85-15898
HITT, R. E., JR. N85-16676
HITTLE, D. C. N85-16306
HOCKERSMITH, J. J. N85-16677
HODGENS, H. M., II N85-15731
HOEKSTRA, B. L. N85-16162
HOELLIG, K. N85-16548
HOFFMAN, J. A. J. N85-16357
HOFFMAN, J. D. N85-15730
HOFFMAN, R. F. N85-16383
HOGARTH, R. M. N85-16572
HOLANDA, R. N85-16096
HOLDEN, W. L. N85-16448
HOLFORD, D. M. N85-15665
HOLT, C. C. N85-16140
HOLT, R. P. N85-16149
HOLTZMAN, J. C. N85-16262
HOMSY, G. M. N85-16078
N85-16084
HONSA, J. N85-16106
HORACE, R. F. N85-16676
HORNER, J. L. N85-15939
HORONJEFF, R. D. N85-16503
HORSTMANN, H. N85-16129
HOTOP, H. J. N85-15709
HOUSTON, A. G. N85-16280
HOUTMAN, W. H. N85-15928
HOVANEC, J. W. N85-16624
HOWARD, D. D. N85-15960
HOWE, M. S. N85-16589
HOWELL, C. N85-16470
HRITZ, R. J. N85-16660
HSIAO, D. K. N85-16481
HSIAO, J. K. N85-15956
HSU, C. H. N85-16062
HUBA, J. D. N85-16328
N85-16337
HUBBARD, R. W. N85-16423
HUDSON, W. N. N85-16568
HUEBLER, J. E. N85-15927
HUGGINS, D. N85-16470
HUGHES, C. E. N85-15888
HUGHES, T. J. R. N85-16209
HUGUS, M. N85-16689
HUSLER, J. N85-16578
HUSSAINI, M. Y. N85-16064
HUTCHINSON, D. P. N85-16643
HUTCHISON, B. A. N85-16327
HUTH, H. N85-16219
HWANG, V. S. S. N85-16281
HYER, M. W. N85-16204

I

IANNA, P. A. N85-16136
IH, C. S. N85-16003
ILIFF, K. W. N85-15752
IMHOF, W. L. N85-15767
INGHAM, J. D. N85-15819
IOANNIDES, A. N85-15780
IRIPKHANOV, B. B. N85-16434
IRISH, L. A. N85-15714
ISHIDA, K. N85-16102
N85-16124
ISHIGAKI, H. N85-15896
ISHIMARU, A. N85-15969
ISHMUKHAMETOV, A. I. N85-16437
ISONO, E. N85-15879
ISSLER, L. N85-16199
ISTEEV, A. I. N85-15854
ITO, Y. N85-16421
IVANITSKIY, A. M. N85-16435
IVANOV, G. R. N85-16132

J

JACEY, M. J. N85-16450
JACOBS, P. F. N85-15695
JACOBSON, M. J. N85-16597
JAIN, A. K. N85-15979
JAJTE, R. N85-16581
JAMESON, A. N85-15694
JANSSEN, D. N85-15760
JARVIS, N. L. N85-16141
JASPER, G. N85-16320
JASPERSE, J. R. N85-16640
JAYNES, R. A. N85-16245
N85-16246
JECK, R. K. N85-16383
JEDLOVEC, G. J. N85-16351
JEE, R. N85-16253
JENDEN, P. D. N85-16287
JENEKHE, S. A. N85-15914
JENKINS, R. M. N85-15724
JEWELL, W. S. N85-16545
JIA-YUN, J. N85-16107
JIA, R. Q. N85-16550
JIAN-HUA, T. N85-16107
JOHANSSON, L. N85-15928
JOHNSON, A. H. N85-15698
JOHNSON, D. L. N85-16306
N85-16320
JOHNSTON, J. T. N85-15666
JOHNSTON, K. J. N85-16723
JONES, B. F. N85-15770
JONES, J. E. N85-16478

JONES, W. R., JR. N85-15897
JORDAN, J. F. N85-16704
JOSEPH, D. D. N85-16081
JOSEPH, J. D. N85-16617
JOYCE, A. T. N85-16247
JU, F. D. N85-16212
JUNG, M. E. N85-15820
JUNGMANN, A. N85-15807
JUREK, Z. J. N85-16568

K

KAHOE, M. W. N85-15713
KAILATH, T. N85-15959
KAKKO, R. N85-16460
KALASHNIKOVA, Y. S. N85-16228
KALLIANPUR, G. N85-16537
KAMAREI, A. R. N85-16473
KAMELANDER, G. N85-16614
KANAL, L. N. N85-16267
KANNAN, D. N85-16537
KAPETANOKOS, C. A. N85-16604
KAPUSTYAN, V. I. N85-15987
KARAKASHEV, V. A. N85-16028
KARANDIKAR, R. L. N85-16537
N85-16577
KARDASHEV, N. S. N85-16717
KAREL, M. N85-16469
N85-16473
KARIM, M. F. N85-16279
KARL, M. L. N85-16404
KARLEN, T. N85-15923
KARRYYEV, B. S. N85-16231
KARUS, Y. V. N85-16235
KASSEL, D. G. N85-15862
KATAOKA, R. W. N85-16452
KATKOV, V. Y. N85-16439
KATSMAN, V. K. N85-15868
KAUFMAN, A. N85-15744
KAZAKOS, D. N85-16579
KAZAKOV, Y. L. N85-16015
KAZINOV, V. A. N85-16045
KAZMIN, Y. B. N85-16226
KEARNEY, K. J. N85-16638
KEIL, D. G. N85-15841
KELLY, F. J. N85-15965
KELLY, T. N85-15793
KENDIG, W. C. N85-15711
KENEY, M. E. N85-15844
KENNEDY, J. F. N85-16279
KERAMIDAS, G. A. N85-16514
KERIBAR, R. N85-16899
KERREBROCK, J. L. N85-16074
KESKINEN, M. J. N85-16337
KESMODEL, L. L. N85-15840
KETCHPEL, R. D. N85-16582
KHARECHKO, G. Y. N85-16233
KHATTAB, A. A. N85-16087
KHUZYASHEV, R. G. N85-16037
KIKIRIKILITSA, S. I. N85-15864
KILDADZE, R. I. N85-16108
KILGORE, R. A. N85-15755
KILLEEN, K. P. N85-16163
KIM, K. G. N85-16661
KIM, S. N85-16080
N85-16082
KIMBATA, Y. N85-16150
KIMHAN, S. C., III N85-16502
KINDWALL, E. P. N85-16463
KING, D. M. N85-16502
KING, J. E. N85-16501
KING, W. J. N85-16628
KINLOCH, A. J. N85-15908
KINSER, D. L. N85-15906
KIRBY, J. G. N85-16683
KISELEV, B. S. N85-16021
N85-16024
KISS, T. N85-16012
KISTOVICH, Y. V. N85-16034
KIZIAH, R. R. N85-16606
KLANN, G. A. N85-15658
KLEIN, G. A. N85-15701
KLEIN, J. N85-15992
KLEIN, M. B. N85-16006
KLEINE, T. N85-16135
KLYUYEV, A. V. N85-16417
KNOERDEL, J. E. N85-16517
KNOTIK, K. N85-16322
KNOWLES, S. H. N85-15965
KOBLOVA, M. M. N85-16021
KOBYLYANSKIY, A. V. N85-16044
KOCH, H. N85-15865
KOCHAN, V. V. N85-16049
KODA, S. N85-15879
KOENIG, E. W. N85-16098
KOENIG, G. N85-16198
KOENIG, G. W. N85-15739
KOERNER, R. M. N85-16215
KOFFEND, J. B. N85-16167
KOHLMAN, D. L. N85-15692
KOINIG, H. N85-16614
KOLCHANOV, V. A. N85-15867
KOLESAR, E. S., JR. N85-15833
KOLISHNIY, B. V. N85-16234
KOLODNIKOV, V. I. N85-16033
KONDRATEV, N. N. N85-15872
KOROLKOV, V. I. N85-16427
KORSAKOV, I. A. N85-16435
KORSHIKOV, V. D. N85-16058
KORT, S. I. N85-16021
KOSHIGOE, L. G. N85-16664
KOSTAL, H. N85-16256
KOTECHA, H. N. N85-16646
KOUL, A. K. N85-15742
KOVACH, A. J. N85-16292
KOVACHEV, B. Z. N85-16120
KOVICH, L. N85-16681
KOVYLIN, V. M. N85-16235
KRAKOWSKI, M. N85-16534
KRAMLICH, D. A. N85-16499
KRASILNIKOV, V. N. N85-16038
KRAUSE, M. O. N85-16610
KRAUSS, M. N85-15843
KRAWCZYK, S. N85-16130
KREMPEL, D. M. N85-16465
KREPS, R. W. N85-15904
KRETSCHMER, F. F., JR. N85-15935
N85-15937
KRISMER, B. N85-15830
KRIVCHENKO, A. I. N85-16434
KRUPENNIKOV, S. A. N85-16057
KRUZE, T. A. N85-16047
KRYLOVA, N. V. N85-16418
KUBALA, A. L. N85-16475
N85-16476
KUKLINA, N. Y. N85-16228
KULKARNI, V. G. N85-16577
KUMAR, M. N85-15982
KUMMEROW, K. N85-16012
KUNIK, W. G. N85-15688
KUNZELMANN, S. N85-16308
KUPERMAN, G. G. N85-16695
KUPFERMAN, Z. N85-15901
KURLOV, S. P. N85-16599
KUROSAKA, M. N85-16073
KURUNOV, I. F. N85-15854
KUSHNER, H. J. N85-16533
KUSHNIRENKO, A. I. N85-16051
KUTAS, R. I. N85-16238
KUTAS, V. V. N85-16233
KUTIN, V. M. N85-16044
KUTSCHALE, H. W. N85-16594
KUZMA, A. N85-16315
KWONG, Y. C. N85-16549

L

LABHARDT, L. N85-16134
LAGAKOS, N. N85-16627
LAGROSS, D. I. N85-16342
LAKE, M. S. N85-15796
LAKIN, W. D. N85-16064
LAKSHMINARAYANAN, M. Y. N85-16259
LAM, J. F. N85-16164
N85-16623
LAMB, S. P. N85-16510
LAN, C. E. N85-15690
LANDRAM, M. O. N85-15911
LANDWEBER, L. N85-16083
LANG, C. H. N85-16176
N85-16177
LANGEREIS, C. G. N85-16522
LANGFORD, M. J. N85-16444
LANGHALS, H. N85-16309
LANING, J. H. N85-15704
LANSING, J. C. N85-16270
LARSEN, J. M. N85-15741
LARSON, D. J., JR. N85-15825
LARSSON, F. N85-15831
LASAPONARA, L. N85-15948
LAU, S. C. M. N85-16061
LAUF, R. J. N85-15916
LAUNAY, J. P. N85-16194
LAVINE, D. N85-16267
LAVIOLETTE, P. E. N85-16281
N85-16282
LAVIRON, A. N85-16520
LAW, E. L. N85-15780
LAWING, P. L. N85-15755
LAWRENCE, C. R. N85-16707
LAWRENCE, R. A. N85-15735
LAWTON, W. M. N85-16254
LAZAR, S. N85-15966
LEA, M. C. N85-16630
LEASURE, R. N85-15707
LEAVENWORTH, R. S. N85-16501
LEE, K. T. N85-16172
LEE, M. N85-16254
LEE, W. P. N85-16444
LEHMBERG, R. H. N85-16638
LEHNER, P. E. N85-16479
LEMME, G. N85-15975
LEPINSKIKH, B. M. N85-16599
LEPPARANTA, M. N85-16411
LERMAN, L. B. N85-16041
LESSART, P. N85-15836
LEVIN, A. D. N85-15716
LEVINE, A. N85-16665
LEVITT, L. J. N85-16401
LEVUSH, B. N85-16001
LEVY, R. N85-15688
LEWIS, B. L. N85-15935
N85-15937
N85-15983
LHUILLIER, C. N85-16091
LIEBERT, C. H. N85-16096
LILJEGREN, T. N85-15924
LIN, C. C. N85-16607
LIND, M. D. N85-16662
LINFIELD, R. P. N85-16707
LINK, M. N85-16012
LINN, W. S. N85-16462
LIONS, P. L. N85-16560
LISHTVAN, I. N85-16316
LITVIN, F. F. N85-16430
LIU, C. T. N85-15885
LIU, D. N85-16204
LIU, G. C. N85-16062
LIVESEY, J. C. N85-16457
LIZKO, N. N. N85-16427
LLORENS, R. N85-15699
LOGSDON, J. N85-15788
LONDON, S. Y. N85-16016
LOOIJEN, J. C. N85-16516
LORD, A. E., JR. N85-16215
LORD, F. M. N85-16561
LORELL, K. R. N85-15795
LORENZINI, E. N85-15772
LOULERGUE, J. C. N85-16170
LU, P. N85-15707
LUDMAN, J. E. N85-15939
LUH, H. N85-15944
LUKASHEVA, O. P. N85-15854
LUKASHIN, I. F. N85-16226
LUKENS, J. E. N85-15979
LUNSFORD, J. H. N85-15842
LURIE, J. B. N85-16641
LUSAYCHUK, Y. S. N85-16433
LUTZ, B. L. N85-16725
LYCHAKOV, D. V. N85-16422
LYON, J. G. N85-16335
LYTLE, F. W. N85-15838
LYUBICH, F. D. N85-16043

M

MA, C. H. N85-16643
MACEWEN, J. D. N85-16425
MACGILLIVRAY, H. T. N85-16127
N85-16128
MACHERAUCH, E. N85-15865
MACHIDA, K. N85-15800
MACMULLIN, R. N85-15719
MADSEN, C. N85-16117
MAHAJAN, B. M. N85-16148
MAIN, B. A. N85-16402
MAINE, R. E. N85-15752
MAJOR, J. S. N85-16477
MAKARETS, N. V. N85-16048
MAKO, F. N85-16604
MALIK, M. R. N85-16063
MALILA, W. A. N85-16268
MALIN, D. F. N85-16114
MALONE, G. A. N85-15875
MALTSEV, A. P. N85-16600
MALY, V. N85-16615
MANCINI, C. N85-15948
MANDL, V. N85-16697
MANELIS, N. G. N85-16436
MANGASARIAN, O. L. N85-16552
MANGE, K. N85-15974
MANHEIMER, W. N85-16001
N85-16604
MANKIEWICH, P. M. N85-15979
MANN, D. M. N85-15849

MANNIX, J. T. N85-15710
MANOLA, F. A. N85-16518
MANUCCIA, T. J. N85-15890
MANUKHIN, A. V. N85-15872
MAO, Z. X. N85-16068
MARCHAL, J. N85-16105
MARCHAND, N. N85-15877
MARCUS, H. L. N85-15829
MARCUS, M. N85-16494
MAREL, C. S. N85-15818
MARIAM, Y. H. N85-15907
MARK, H. N85-16665
MARQUES, E. C. N85-15836
MARQUINA, N. N85-16634
MARR, J. D. N85-16692
MARROQUIN, J. L. N85-16526
MARSCHALL, E. N85-16088
MARSHALL, T. C. N85-16165
MARSTON, P. T. N85-16476
MARTIN, E. L. N85-16466
MARTIN, H. L. N85-16187
MARTIN, M. V. N85-16252
MARTO, P. J. N85-16079
MARTYS, C. R. N85-16116
MARZI, A. N85-15945
MASURENKOV, Y. N85-16239
MATSUYAMA, T. N85-16261
MATT, D. R. N85-16327
MATTHEW, C. B. N85-16423
MATTHEWS, C. G. N85-16565
MATTHEWS, E. W. N85-15944
MATVEYENKO, L. I. N85-16710
N85-16720
MAURY, A. N85-16105
MAZEL, D. S. N85-16586
MCBRIDE, B. N85-16663
MCBRIDE, R. D. N85-16558
MCCAIN, W. E. N85-15697
MCCANN, T. N85-16681
MCCLINTOCK, L. L. N85-15941
MCCONNELL, P. M. N85-15920
MCCORMACK, J. R. N85-16332
MCCUNE, J. E. N85-16074
MCDANIEL, R. L. N85-15717
MCDONALD, A. B. N85-15710
MCDONALD, H. N85-16070
MCFARLANE, M. N85-15794
MCFARLANE, R. A. N85-16623
MCGEOCH, M. W. N85-16171
MCGILL, D. W. N85-16680
MCGRATH, D. T. N85-15972
MCKEAGUE, I. W. N85-16527
MCKENNA, P. M. N85-16350
MCKENZIE, E. N85-16536
MCLAUGHLIN, D. W. N85-16413
MCLEAN, E. A. N85-16638
MCLELLAN, G. H., JR. N85-16619
MCLINDEN, L. N85-16544
MCQUISTAN, R. B. N85-16530
MCWHORTER, A. L. N85-16656
MEEHAN, R. J. N85-15922
MEHALIC, C. M. N85-15725
MEHTA, H. K. N85-15920
MEIBURG, E. N85-16078
MEIER, D. L. N85-16707
MEISEL, L. V. N85-15883
MELLIERE, R. A. N85-15666
MELNIK, R. E. N85-15694
MELTON, H. E. N85-16463
MENEGHINI, R. N85-16273
MENENDEZ, C. J. N85-16380
MERKLEY, D. J. N85-15675
MEROLA, J. A. N85-16245
MESSINA, C. G. N85-16508
METCALFE, N. N85-16109
N85-16126
METZLER, M. D. N85-16268
MICOL, J. R. N85-16065
MIELKE, R. R. N85-16586
MIESS, J. O. N85-15719
MIFFLIN, R. T. N85-16080
MIHLAN, G. I. N85-16013
MIHORA, D. J. N85-15994
MIKAELYAN, A. L. N85-16021
MIKHAIL, E. M. N85-16263
N85-16276
MIKULAS, M. M., JR. N85-15796
MILES, R. O. N85-16152
MILEY, G. N85-16712
MILLER, C. G., III N85-16065
MILLER, C. K. S. N85-15977
N85-16147
MILLER, D. R. N85-16299
MILLER, G. W. N85-15941
MILLER, S. M. N85-16641
MILLER, W. F. N85-16290
MILLIGAN, T. A. N85-15936
MILLS, H. N85-16500
MINER, E. W. N85-16514
MINOO, H. N85-15988
MIRELS, H. N85-15952
MIROVITSKIY, D. I. N85-16022
MIROVSKIY, D. I. N85-16023
MISIANO, C. N85-15948
MITAGVARIYA, N. P. N85-16431
MITCHELL, O. R. N85-16276
MITCHELL, R. I. N85-16013
MITTRA, R. N85-15779
N85-15943
N85-16005
MIYOSHI, K. N85-15893
N85-15896
MIZERA, P. F. N85-16405
MOATS, R. R. N85-15986
MOBILIA, J. N85-15767
MOCK, E. A. T. N85-16300
MOFFETT, M. B. N85-16584
MOHN, J. H. N85-15731
MOLION, L. C. B. N85-16370
MOM, A. J. A. N85-15738
MONIN, A. S. N85-16227
MONNA, W. A. A. N85-16409
MONTGOMERY, E. T. N85-16414
MOODY, E. S. N85-16097
MOORE, A. L. N85-15756
MOORE, E. F. N85-16090
MOORE, R. K. N85-15960
N85-15963
MOORE, W. H. N85-16454
MOORHEAD, A. J. N85-15916
MORAN, K. M. N85-15701
MOREL, T. N85-16699
MORGENSTERN, G. N85-15973
MORHANGE, J. F. N85-16652
MORI, I. N85-16150
MORRIS, C. N. N85-16256
MORRISON, K. M. N85-15919
MORROW, T. B. N85-16449
MORTON, J. N85-15703
MOSCHNER, K. W. N85-16671
MOSKALENKO, Y. Y. N85-16434
MOSTOVOY, I. V. N85-16050
MOURA, A. D. N85-16366
MUELLER, A. N85-15863
MUELLER, D. N85-15807
MUIR, J. A. N85-15828
MUKERJEE, H. N85-16566
MULLER, S. H. N85-16409
MUNSON, H. E. N85-15731
MUNTZ, C. N85-16494
MURAMOTO, K. K. N85-15688
MURATOV, A. N85-16224
MURPHY, E. A. N85-16332
MURTHY, P. L. N. N85-15822
MUSIKANT, S. N85-16698
MYAGKOV, K. A. N85-15871
MYER, J. N85-16625
MYERS, J. D. N85-16169
MYERS, L. P. N85-15729
MYERS, T. D. N85-15813
N85-15815
MYKKELTVEIT, S. N85-16330
MYKLEBUST, R. L. N85-16519

N

NADEL, M. N85-16472
NAGLE-ESHLEMAN, J. N85-16200
NAGY, K. N85-15796
NAIDENOV, A. I. N85-15854
NAKANO, G. H. N85-15767
NAMAZOV, S. A. N85-16035
NATRIASHVILI, V. B. N85-16108
NAZAROV, V. L. N85-16022
NAZMY, M. Y. N85-15746
NEBB, J. N85-15774
NEFF, D. H. N85-15881
NEILSON, G. H. N85-16844
NEILSON, R. H. N85-15910
NELEPO, B. O. N85-16229
NEMEC, A. F. L. N85-16567
NESSE, T. N85-15865
NETTLE, V. H., JR. N85-16155
NEUNABER, R. N85-15669
NEWCOMB, R. N85-16553
NEWMAN, B. A. N85-16661
NEWMAN, J. S. N85-16595
NEWTON, H. J. N85-16258
NGUYEN, K. N85-16081
NICHOLAS, T. N85-15741
NICKEL, H. N85-16221
NICOLET, M. A. N85-16659
NIGHTENGALE, F. W. N85-16671
NIKOLAYENKO, E. M. N85-16439
NIKOLOV, N. S. N85-16132
NINK, C. N85-16103
NOACK, M. A. N85-15766
NOBRE, C. A. N85-16376
NOGUCHI, T. N85-16125
NOHEL, J. A. N85-16548
NORENKOV, I. P. N85-16055
NORMAN, C. A. N85-16703
NORRMAN, P. N85-16340
NORTON, M. G. N85-16666
NOUR-OMID, B. N85-16492
N85-16532
NOVINSON, T. N85-15909
NOVITSKAYA, L. P. N85-16440
NOWAK, P. N85-16284
NOZAWA, Y. N85-16421

O

OBENSCHAIN, S. P. N85-16638
OBRIEN, C. N85-16324
OBRIEN, J. J. N85-16365
OBTEMPERANSKIY, Y. S. N85-16052
ODEKOV, O. A. N85-16232
ODENWALD, S. N85-15985
ODENWELLER, J. N85-16289
ODRISCOLL, P. F. N85-15799
OEMRAW, B. N85-16408
OESTMARK, H. N85-16173
OGGERO, M. N85-15942
OHATA, C. A. N85-16447
OHLMANN, R. C. N85-16153
OKAMURA, S. N85-16127
OLINER, A. A. N85-16007
OLIPHANT, J. L. N85-16424
OLLINGER, O. N85-16470
OLSON, D. B. N85-15841
OLSON, E. C. N85-16267
OMEARA, M. W. N85-16678
ONSTOTT, R. G. N85-16960
N85-15963
OREAR, J. G. N85-15889
ORLOV, Y. I. N85-16035
OROVETSKIY, Y. P. N85-16237
ORTEGA, J. M. N85-16525
OSIPENKO, P. E. N85-16175
OSOSKOV, B. A. N85-15869
OWEN, G. N85-16570
OWEN, T. N85-16725

P

PACK, G. J. N85-16302
PACKER, L. N85-15925
PADERES, F. C., JR. N85-16263
PADERINA, T. V. N85-16028
PAEZ, T. L. N85-16212
PAKER, Y. N85-16521
PALAS, T. N85-16367
PALAZZO, A. J. N85-16424
PALENZUELA, E. N85-16380
PALMBAKH, L. R. N85-16422
PANDOLF, K. B. N85-16448
N85-16455
PAPANICOLAOU, G. N85-16413
PAPANTONI-KAZAKOS, P. N85-16579
PAQUIN, A. N85-15678
PARIS, D. T. N85-15953
PARKER, K. G. N85-16325
PARRISH, J. R. N85-15976
PARTANEN, J. N85-16460
PASCHENKO, V. P. N85-16645
PATEL, V. C. N85-16083
PATTERSON, D. J. N85-15919
PATTON, J. F. N85-16450
PAUL, D. R. N85-15903
PAVLIKEVICH, B. E. N85-15712
PAVLOV, Y. A. N85-15872
PAYSON, R. P. N85-16008
PEARMAN, G. I. N85-16324
PEELE, J. R. N85-15890
PELISCHEK, T. N85-15796
PELLOUX, R. M. N85-15877
PELTZER, R. D. N85-16071
PENA, D. N85-16574
PENCE, T. J. N85-16076
PENNINGTON, N. J. N85-16412
N85-16414
PENNYCOCK, S. J. N85-16609
PENNYCOOK, J. W. N85-16450
PERALA, R. A. N85-16349
N85-16350

PERCHE, G. E. N85-15805
PEROV, M. G. N85-16228
PEROV, P. I. N85-16054
PERRIZO, W. N85-16693
N85-16696
PERRY, L. M. N85-16456
PERSAUD, C. N85-16381
PERSSON, B. N85-15888
PESOTAN, H. N85-16542
PETERS, C. N85-16255
PETERS, K. N85-16101
PETIAU, C. N85-15879
PETOIA, S. R. N85-16183
PETROV, G. V. N85-16051
PETROV, Y. A. N85-16438
PETROVA, L. N. N85-16427
PHILLIPS, J. D. N85-15693
PIERCY, T. G. N85-15811
PIKE, C. T. N85-16171
PILMAN, L. N85-16428
PINCKERT, R. E. N85-15666
PINEAU, A. N85-15740
PIRICH, R. G. N85-15824
PISH, R. H. N85-16449
PLANK, V. G. N85-16342
PLEMMONS, R. J. N85-16564
PLESKACH, V. I. N85-15869
PLEUKHOV, A. N. N85-16037
PLICHTA, E. J. N85-16304
POGGIO, T. N85-16458
POGREBENKO, S. V. N85-16711
N85-16717
POHLE, R. H. N85-16153
POKROVSKIY, Y. O. N85-16018
POLEY, R. N85-15793
POLK, M. B. N85-15907
POLLAK, T. M. N85-16650
POMEROY, P. W. N85-16331
PONCE, J. V. N85-16382
PONOMARENKO, V. A. N85-16420
PONSFORD, J. S. N85-15747
PONTON, M. K. N85-16587
POOLE, W. E. N85-15731
POPOV, M. V. N85-16711
POPOV, V. A. N85-15856
PORET, L. N85-15740
POURAHMADI, M. N85-16580
POVINELLI, L. A. N85-15688
N85-15757
POWELL, G. A. N85-16454
POWELL, R. W. N85-15778
POWERS, E. J. N85-15998
POWERS, G. D. N85-16447
PRAVOVEROV, N. L. N85-16042
PRESSON, E. N85-16498
PRESTON, R. A. N85-16707
PRITCHARD, D. E. N85-16603
PRITCHETT, L. N85-16692
PROKOFYEVA, L. M. N85-16317
PURVIS, W. J. N85-15922
PYRIKOV, A. N. N85-15832

Q

QUAN, C. K. N85-16286
QUINN, J. J. N85-16585

R

RADHAKRISHNAN, K. N85-15726
RADMER, R. N85-16469
N85-16470
RAGAN, R. R. N85-15704
RAHARTO, M. N85-16125
RAMAN, R. K. N85-16289
RAMIREZ, J. M. N85-16358
RANSON, K. J. N85-16241
RASMUSSEN, J. L. N85-16355
N85-16356
RAUCH, H. N85-16698
RAUSCHER, E. N85-15670
RAY, R. J. N85-15729
RAYEVSKIY, M. A. N85-16039
RAYMER, M. G. N85-16630
READHEAD, A. C. S. N85-16707
N85-16713
REDDICK, H. K., JR. N85-15675
REED, D. J. N85-16457
REED, J. L. N85-15907
REHBEIN, T. J. N85-15985
REHM, R. G. N85-16089
REID, L. N85-15757
REID, M. J. N85-16721
REINMANN, J. J. N85-15757
REITSAMER, G. N85-16615
REMIZOV, I. N. N85-16433
REMMERT, W. N85-16688
RENARDY, M. N85-16077
N85-16081
RENARDY, Y. N85-16081
RENGSTORFF, G. W. P. N85-15896
REPPERGER, D. W. N85-15721
N85-16459
RESING, H. A. N85-16601
REZVOV, A. V. N85-16047
RICHTER, G. P. N85-15702
RICKARD, D. P. N85-16672
RICKLEY, E. J. N85-16595
RIDD, M. K. N85-16245
RIDDER, T. B. N85-15853
RIDGLEY, D. N85-15995
RIEGEL, J. P. N85-16449
RILEY, R. P. N85-15732
RINGHOFER, C. N85-16004
RIPIN, B. H. N85-16638
RITTER, C. N85-15904
RITTER, K. N85-16547
ROBERTS, D. E. N85-16450
ROBERTS, D. H. N85-16709
ROBERTS, J. B. N85-16201
ROBERTS, T. N85-15944
ROBERTSON, J. S. N85-16597
ROBERTSON, T. N85-16566
ROCKLEY, M. G. N85-15846
RODGERS, C. R. N85-16338
RODRIGUEZ, M. G. N85-15828
ROEHR, W. D. N85-16347
ROLLS, M. J. N85-15707
ROMERO, M. N. N85-15663
ROOK, F. W. N85-16479
ROSCOE, D. V. N85-16070
ROSE, W. C. N85-16067
ROSEN, B. N85-15975
ROSENBERGER, G. N85-15913
ROSENKRANTZ, W. A. N85-16528
ROSENTHAL, R. E. N85-16679
ROTH, C. N85-16092
ROTH, J. T. N85-16680
ROYCE, R. K. N85-15981
ROYLANCE, G. N85-16515
ROZANOV, V. B. N85-16637
ROZANOVA, M. A. N85-16046
RUBEY, W. A. N85-16146
RUDAKOV, V. A. N85-16717
RUDOLPH, T. H. N85-16350
RUKHADZE, A. A. N85-16637
RUMYANTSEV, K. Y. N85-16026
RUNKLE, L. D. N85-16297

S

SABATINI, S. N85-15946
SABO, J. D. N85-15704
SACHENKO, A. A. N85-16049
SADER, S. A. N85-16247
SAGDEEV, R. Z. N85-16705
N85-16717
SAGE, A. P. N85-16670
SAKAI, H. N85-16336
SALAKHUTDINOV, V. K. N85-16024
SALAMA, K. N85-16211
SALAS, M. D. N85-15694
SALOMON, M. N85-16304
SALVI, T. C. N85-16618
SAMANTA, S. N85-16698
SANDEL, F. N85-16604
SANDSTROM, D. R. N85-15838
SARTORI, P. N85-15948
SATANEK, J. I. N85-15905
SATKINS, S. W. N85-16517
SATTLEY, K. N85-16494
SAVAGE, A. N85-16112
SAWKA, M. N. N85-16448
N85-16455
SAYWARD, J. M. N85-15912
SCAGLIONE, P. H. N85-16447
SCHAEFER, G. N85-16265
SCHAFER, R. W. N85-15953
SCHARR, K. G. N85-16332
SCHARZMANN, U. N85-16012
SCHEINBEIM, J. I. N85-16661
SCHEPE, K. N85-15807
SCHERBAKOV, A. G. N85-16111
SCHEUER, H. G. N85-16129
SCHEUER, P. A. G. N85-16714
SCHIESS, J. R. N85-16565
SCHILIZZI, R. T. N85-16704
SCHIMKE, S. M. N85-16069
N85-16087
SCHIMMERLING, W. N85-16728
SCHLESINGER, S. P. N85-16165
SCHMID, H. N85-16198
SCHMITZ, E. N85-16178
SCHNABEL, R. B. N85-16538
N85-16540
SCHNEIDER, K. N85-15749
SCHNEIDER, W. N85-15796
SCHOENING, W. E. N85-16103
SCHOMMER, T. G. N85-16672
SCHOWENGERDT, R. N85-16250
SCHRADER, H. W. N85-16104
SCHREDDER, J. M. N85-16298
SCHUBERT, F. H. N85-16292
SCHUETZ, R. N85-15669
SCHULZ, M. N85-16339
SCHUMAKER, L. L. N85-16257
SCHUSTER, H. N85-16221
SCHWANEBECK, W. N85-15834
SCHWARTZ, I. B. N85-16337
SCHWIER, G. N85-15830
N85-15917
SCOLA, D. A. N85-15892
SCOTT, D. W. N85-16253
SCOTT, W. G. N85-15944
SCOTT, W. R. N85-16003
SCRUBY, C. B. N85-16203
SCUDDER, J. D. N85-16726
SDOUZ, G. N85-16813
N85-16614
SEARS, T. B. N85-16675
SEDDON, K. R. N85-15852
SEGUR, H. N85-16085
N85-16086
SEIDEL, D. A. N85-15696
SEIDEL, R. W. N85-16161
SEIDERS, R. P. N85-16824
SEINER, J. M. N85-16587
SEITTER, W. C. N85-16129
SELIVANOR, N. N85-16240
SELWOOD, R. K. N85-15913
SEROVA, L. V. N85-16427
SEUNIK, H. N85-16011
SEYFERTH, D. N85-15899
SHABANOV, M. F. N85-16110
SHAKHOVSKAYA, N. I. N85-16111
SHAMROTH, S. J. N85-16070
SHANMUGAN, K. S. N85-16262
SHAPIRO, B. I. N85-16111
SHAPIRO, I. I. N85-16280
SHAPOVALOVA, L. G. N85-16202
SHAPRAN, A. A. N85-15969
SHAROV, A. M. N85-16054
SHARP, T. J. N85-15662
SHASHARIN, G. N85-16313
SHATOKHA, V. I. N85-15868
SHAW, D. E. N85-15717
SHAW, L. M. N85-15689
SHAW, R. J. N85-15702
N85-15758
SHAW, S. J. N85-15908
SHEMAGIN, I. A. N85-16056
SHEMYAKOV, A. A. N85-16645
SHEN, H. D. N85-16195
SHEN, H. T. N85-16274
SHEPHERD, K. P. N85-16588
SHERIDAN, T. B. N85-16474
SHEU, Y. C. N85-16195
SHIAU, T. H. N85-16555
SHIELDS, F. D. N85-16592
SHILOV, V. M. N85-16427
SHIMABUKURO, F. I. N85-15966
SHIMADA, K. N85-16295
SHIPMAN, B. N85-16494
SHISHKIN, Y. M. N85-16015
SHKITIN, V. A. N85-16021
SHKLYAR, F. R. N85-16058
SHOEMAKER, R. L. N85-16664
SHORE, C. P. N85-16066
SHORE, R. A. N85-15961
N85-15962
SHPUNGIN, S. N85-16432
SHRIVER, D. F. N85-15902
SHUEN, J. S. N85-15728
SHUMILO, T. V. N85-16041
SICLARI, M. J. N85-15685
SIDOROV, V. V. N85-16037
SIECKMANN, D. G. N85-16445
SIEGMANN, W. L. N85-16597
SIERON, R. N85-16269
SILMAN, G. I. N85-15870
SIM, M. E. N85-16102
SIMON, R. S. N85-16707
SIMOYLENKO, V. I. N85-16029
SKLOVSKAYA, M. L. N85-16437
SKOK, V. I. N85-16433

SKOLNIK, L. H. N85-16635
SKOTNICKI, J. N85-15678
SKURSKIY, P. P. N85-16041
SLEMP, W. S. N85-15894
SLETTEN, C. J. N85-15961
SLOAN, S. J. N85-16464
SLUD, E. N85-16267
SLUNGA, R. N85-16340
SMAGORINSKY, J. N85-16353
SMETANA, J. N85-15779
SMITH, A. G. N85-16104
SMITH, D. N85-16333
SMITH, G. B. N85-16266
SMITH, M. E. F. N85-15743
SMITH, M. L. N85-15769
SMITH, R. C. N85-15716
SMITH, R. H. N85-16290
SMITH, R. K. N85-16013
SMITH, S. D. N85-15801
N85-15802
N85-15803
SMITH, T. S. N85-15938
SMITH, W. B. N85-16258
SMITHERS, M. E. N85-16618
SMOLL, A. N85-15944
SMOOTZ, E. R. N85-16476
SMUROV, M. Y. N85-16048
SMYK, A. F. N85-16023
SOBOTA, J. N85-16222
SODHI, D. S. N85-16277
SOEDER, R. H. N85-15725
SOH, S. H. N85-16658
SOKOLOV, V. A. N85-16056
SOLOMENTSEV, S. L. N85-16058
SOLOMON, A. M. N85-16406
SOLOMON, A. S. P. N85-15728
SOLOVEF, E. E. N85-16645
SOMS, A. P. N85-16548
SONSINO, C. M. N85-15886
SORIN, S. B. N85-15867
SPAEPEN, F. N85-15915
SPARKS, L. L. N85-15918
SPEAR, R. N85-16472
SPEARMAN, M. L. N85-15657
SPECTOR, A. Z. N85-16486
SPEER, T. M. N85-15734
SPENCER, M. G. N85-15999
SPERLING, J. L. N85-16328
SPEZIO, A. N85-16616
SPIEKHOUT, D. J. N85-15667
SPINGARN, J. E. N85-16506
SPRINGSTON, P. S. N85-15754
SRIDHAR, B. N85-15795
ST.CLAIR, A. K. N85-15894
STAATS, P. A. N85-16643
STACEY, J. M. N85-15798
N85-15989
N85-15990
N85-15991
STAHL, W. N85-16309
STALCUP, H. F. N85-15659
STAMPER, J. A. N85-16638
STANCIK, K. N85-15725
STANKOVIC, J. A. N85-16487
N85-16523
STANLEY, G. M. N85-16209
STARK, J. A. N85-16664
STAROPOLI, F. N85-15682
STECKER, F. W. N85-16729
STECKL, A. N85-15964
STECURA, S. N85-15878
STEEL, D. G. N85-16623
STEIGERWALD, R. L. N85-16488
STEINBERG, D. M. N85-16556
STEIR, M. N85-15794
STEPANOV, S. I. N85-15866
STEPANOV, V. B. N85-16600
STEVENS, B. N85-16605
STEVENS, W. J. N85-15843
STEWART, D. A. N85-16401
STEWARTSON, K. N85-16069
STEYSKAL, H. N85-15962
STICKLER, D. N85-16591
STIFFEY, A. V. N85-16141
STINCHCOMB, W. W. N85-15821
STOBIE, R. S. N85-16127
STOBOR, A. N85-16101
STOLBA, G. N85-16615
STONE, H. W. N85-15778
STOUGHTON, J. E. N85-15900
STOW, B. M. N85-16072
STRAHLER, A. H. N85-16265
STRAUB, F. K. N85-15715
STRAYER, M. R. N85-16608
STRIGL, A. N85-16615
STROM, U. N85-16093
N85-16585
STROUGHTON, R. S. N85-16187
STRUCHKOV, A. I. N85-16042
STRUCK, H. N85-15677
STURGEON, J. R. N85-15665
STURROCK, P. A. N85-16727
STUTIUS, W. E. N85-16657
SUITS, G. H. N85-16269
SUKHIKH, N. N. N85-16048
SUMMERS, R. H. N85-16196
SUMMERS, R. L. N85-16100
SUMMERSON, W. A. N85-16185
SUNG, N. W. N85-15919
SURGUCHEVA, E. A. N85-16058
SUTHERLAND, D. N85-16489
SUTTON, G. H. N85-16331
SWEAN, T. F., JR. N85-16071
SZABO, B. N85-16535
SZCZESNY, P. M. N85-16488
SZUCH, J. R. N85-15757
SZUSZCZEWICZ, E. P. N85-16639

T

TABATA, N. N85-16150
TABLER, R. E., JR. N85-16451
TAGGE, G. E. N85-15714
TAM, A. C. N85-16170
TAMARINA, A. M. N85-15866
TANG, C. J. N85-16083
TAPPAN, D. V. N85-16450
TARABRIN, G. K. N85-15867
TARBELL, S. A. N85-16412
TARTAKOVSKIY, L. B. N85-16033
TASK, H. L. N85-16453
N85-16467
TATKO, V. L. N85-16435
TAVERNA, A. R. N85-15797
TAWARI, P. V. N85-15707
TAYLOR, E. P. N85-16675
TAYLOR, R. E. N85-16664
TAYLOR, R. L. N85-16492
N85-16532
TAYLOR, W. N85-16654
TAYLOR, W. R. N85-15736
TEAGAN, W. P. N85-15804
TEMPLETON, A. E. N85-16493
TEPLYAKOV, V. A. N85-16600
TETELBAUM, D. I. N85-16047
TEUBER, D. N85-16129
THAL, H. L., JR. N85-15984
THAMBURAJ, R. N85-15742
THOMAS, J. N85-15760
THOMPSON, J. F. N85-16543
THORNE, B. B. N85-16519
TIBBITTS, T. W. N85-16471
TIBSHIRANI, R. J. N85-16559
N85-16571
N85-16573
TICE, A. R. N85-16424
TIEDTKE, P. N85-15808
TIEGS, T. N. N85-15916
TIEMANN, J. N85-15964
TIMOTHY, J. G. N85-16621
N85-16622
TITTMANN, B. R. N85-16329
TIWARI, S. N. N85-16059
TOLLAR, E. S. N85-16529
TOLLE, F. F. N85-15920
TOMASHEVICH, S. V. N85-16016
TOMPKINS, W. T., JR. N85-16074
TONER, M. M. N85-16448
N85-16455
TORRES, J. L. N85-16146
TOWNE, C. E. N85-15888
TOWNSEND, D. P. N85-16099
TOWNSEND, L. W. N85-16728
TRAN, T. N85-16611
TRAVERSO, L. W. N85-16444
TREADO, S. N85-16688
TRIFONOV, A. P. N85-16030
TRISCARI, T., JR. N85-16691
TROKHIMENKO, Y. K. N85-16043
TRONG, N. N. N85-15673
TRONRUD, L. B. N85-16326
TRUKKEN, S. J. N85-16186
TRUNK, G. V. N85-15967
TSAKNAKIS, H. N85-16579
TSANG, T. N85-16601
TSAO, S. S. N85-15915
TSAREVSKY, G. S. N85-16717
TSENG, W. W. N85-15699
TSINTSAROV, V. I. N85-16120
TSITSIKLIS, J. N85-16674
TSVETKOV, M. K. N85-16120
TSVYASHCHENKO, V. A. N85-16238
TUCHOLKE, H. J. N85-16129
TURLO, Z. N85-16130
TVETEN, A. B. N85-16152
TYUKHTIN, A. V. N85-16038
TZAREVSKY, G. S. N85-16711

U

ULBRICH, G. N85-15974
ULFERS, B. G. N85-15839
URBACH, A. R. N85-15793
URLICHS, K. N85-16180
USDANSKY, S. I. N85-16283

V

VANCE, J. D. N85-16008
VANDERHORST, J. N85-16407
VANDERLAAN, H. N85-16701
VANDERLINDEN, H. H. N85-16310
N85-16311
VARASI, M. N85-15948
VARVEL, D. A. N85-16693
N85-16696
VASILYEV, V. A. N85-16027
VASLEYB, Y. V. N85-16020
VAUGHAN, W. W. N85-15773
VAVILKIN, N. M. N85-15856
VEEH, J. A. N85-16568
VEGMAN, E. F. N85-15832
VEKSHIN, B. S. N85-16202
VELDMAN, R. J. N85-15683
VELIKHOV, Y. P. N85-16230
VELTEN, R. M. N85-15722
VENABLES, A. N85-16470
VERHOEVEN, J. D. N85-15766
VERKHOTIN, M. A. N85-16441
VERNOT, E. H. N85-16425
VINNIKOV, Y. A. N85-16422
VISSER, J. C. N85-16319
VOGELSONG, T. N85-15964
VOIGT, R. G. N85-16525
VOLKMER, C. C. N85-16129
VOLKOVA, M. I. N85-16439
VOSS, S. S. N85-16612
VREELAND, T., JR. N85-16659

W

WADDINGTON, G. K. N85-15747
WADE, W. L., JR. N85-15845
WAGNER, R. C. N85-15895
WALDRON, J. D. N85-16123
WALKDEN, A. N85-15871
WALKER, C. W., JR. N85-15845
WALKER, D. N. N85-16639
WALKER, T. J. N85-16321
WALL, J. A. N85-16632
WALLACE, B. L. N85-15851
WALLACE, W. N85-15742
WALTMAN, W. B. N85-15965
WARD, A. P. N85-15672
N85-15680
WARD, J. R. N85-16624
WARD, K. H. N85-16669
WARNATZ, J. N85-15834
WATANABE, R. N85-16421
WEAVER, D. P. N85-15849
WEBB, K. J. N85-16005
WEI, R. P. N85-16214
WEINBERG, B. C. N85-16070
WEINZIERL, F. N85-16011
WEISER, K. N85-16093
WEISS, R. S. N85-16294
WEISZ, Z. S. N85-15826
WELLER, A. N85-15887
WELLINGHOFF, S. T. N85-15914
WELLS, B. N85-16692
WERNER, M. W. N85-16724
WERTHEN, J. G. N85-16657
WESSELINK, T. N85-16131
WESSELSKI, C. N85-15796
WEST, D. C. N85-16406
WETTSTEIN, H. N85-15746
WEXLER, R. L. N85-16400
WEYMAN, J. N85-16403
WHEELER, R. M. N85-16471
WHITE, C. C., III N85-16670
WHITE, J. D. N85-16151
WHITESIDE, J. H. N85-16508
WHITLOW, W., JR. N85-15696
WHITTY, D. A. N85-15921
WICKI, A. N85-15748
WIENER, A. I. N85-15970

WIESELTHIER, J. E. N85-15957
WIESEMANN, W. N85-16285
WIIN-NIELSEN, A. C. N85-16363
N85-16364
WIKIERSKI, B. N85-16130
WILGEN, J. B. N85-16643
WILHELM, H. N85-16190
N85-16191
WILKEN, K. N85-16218
WILKINSON, P. N. N85-16707
N85-16708
WILLIAMS, C. H. H. N85-15743
WILLIAMS, M. C. N85-15900
WILLIAMS, R. A. N85-15719
WILLIAMS, S. D. N85-15777
WILLIS, P. B. N85-16296
WILSON, H. R. N85-16308
N85-16309
WILSON, J. W. N85-16728
WINER, H. P. N85-15901
WINKELHOFER, W. N85-16322
WISEMAN, G. H. N85-15899
WISIAN-NEILSON, P. N85-15910
WISSINGER, A. N85-15794
WITCHER, L. D. N85-16444
WITTWER, V. N85-16308
N85-16309
WOHLTJEN, H. N85-15891
N85-16141
WOLD, A. N85-15995
WOLF, D. S. N85-15723
WOLF, H. C. N85-16266
WOLF, S. A. N85-16093
WOLFMUELLER, K. N85-16192
WOLOCH, F. N85-16614
WONG, J. N85-15838
WONG, M. N85-16728
WOOD, R. K. N85-16558
WOODCOCK, C. E. N85-16265
WOODS, R. A. N85-16303
WOSZCZYK, A. N85-16130
WRIGHT, F. T. N85-16566
WRIGHT, J. W. N85-15848
WRIGHT, T. W. N85-16216
WYNVEEN, R. A. N85-16292
WYSS, C. N85-16143

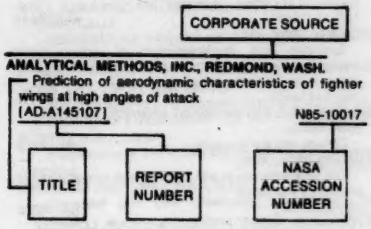
Y

YAGI, S. N85-16150
YAKUBOVICH, V. V. N85-16175
YAMADA, T. N85-16421
YAMAGUCHI, I. N85-16207
YANYUK, V. I. N85-16021
YASUTOSHI, H. N85-15898
YATES, J. E. N85-16590
YAVLOCHKINA, L. M. N85-16237
YEFIMOV, V. V. N85-16229
YELINSON, M. I. N85-16054
YEN, H. W. N85-16625
YEMINA, Y. P. N85-16030
YOUNG, F. C. N85-16638
YU, F. T. S. N85-16138
YUEN, H. P. N85-16631
YUN, H. M. N85-16221
YUSUPOV, V. S. N85-15856

Z

ZABEL, W. V. N85-16656
ZALESAK, S. T. N85-16328
ZARETSKY, E. V. N85-16099
ZAROSHCHINSKIY, O. I. N85-16029
ZASTROW, A. N85-16309
ZAVALOVA, N. D. N85-16420
ZEBIB, A. N85-16078
N85-16084
ZEGER, J. N85-16615
ZELEZNIK, F. J. N85-16663
ZELINSKI, A. N85-15913
ZENGJING, C. N85-15698
ZHAMALETDINOV, A. A. N85-16230
ZHDANOV, M. S. N85-16230
ZHONG, W. F. N85-16195
ZICHA, J. N85-16106
ZICHOVA, O. N85-16106
ZIMMER, W. J. N85-15761
ZINKOVSKIY, A. V. N85-16429
ZIXIANG, Z. N85-15698
ZOLOTOV, A. M. N85-16524
ZONG-HAI, X. N85-16107
ZORASTER, S. N85-16689
ZOUGHI, R. N85-15963
ZVALINSKIY, V. I. N85-16430

Typical Corporate Source Index Listing



Listings in this index are arranged alphabetically by corporate source. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The NASA accession number denotes the number by which the citation is identified. The titles are arranged under each corporate source in ascending accession number order.

A

ABASTUMANI ASTROPHYSICAL OBSERVATORY, GEORGIA (USSR).
The results of hydrogen hypersensitization of photoemulsions N85-16108

ACADEMY OF SCIENCES, ALAMAR (CUBA).
Evaluation of the climatic resources of Cuba applied to agricultural work N85-16380

ACADEMY OF SCIENCES (USSR), MOSCOW.
Some prospects of space VLBI N85-16705
Limitation of VLBI angular resolution N85-16710
Processing system for space VLBI N85-16711
The wide-range space radio interferometer N85-16717
Water maser outburst N85-16720

ADMIRALTY MARINE TECHNOLOGY ESTABLISHMENT, HOLTON HEATH (ENGLAND).
Corrosion fatigue crack growth rates of weldments in QIN steel
[AMTE(M)-R-83003] N85-15770

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT, NEUILLY-SUR-SEINE (FRANCE).
Operational Loads Data
[AGARD-CP-375] N85-15654
Keeping up with operational loads in the French Air Force: Defining new equipment N85-15681
Engine Cyclic Durability by Analysis and Testing
[AGARD-CP-368] N85-15733
Ramjet and Ramrocket Propulsion Systems for Missiles
[AGARD-LS-136] N85-15809

AERITALIA S.P.A., TORINO (ITALY).
Flight parameters recording for structure fatigue life monitoring N85-15682

AEROCHEM RESEARCH LABS., INC., PRINCETON, N. J.
Mechanism of soot formation
[AD-A146817] N85-15841

AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON, INC., N. J.
An analytical model of periodic waves in shallow water
[AD-A147501] N85-16085
An analytical model of periodic waves in shallow water
[AD-A147502] N85-16086
Analysis of the surface load and radiated sound of a vibrating airfoil with application to the experiment of Brooks
[NASA-CR-3864] N85-16590

AERONAUTICAL RESEARCH LABS., MELBOURNE (AUSTRALIA).
The constant current strain gauge bridge
[ARL-STRUC-TM-385] N85-16097

AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AFB, OHIO.
USAF approach to airborne structural data recording: Airborne Data Acquisition Multifunction System (ADAMS) N85-15683
Accelerated Mission Endurance Testing (AMET) N85-15736

AEROSPACE CORP., EL SEGUNDO, CALIF.
Reverse wave suppression in unstable ring resonator
[AD-A146825] N85-15952
A quasi-optical method for measuring the complex permittivity of materials
[AD-A147483] N85-15966
Photochemistry and kinetics of the O*2-HI system
[AD-A147433] N85-16167
Earth's radiation belts
[AD-A147927] N85-16339
Remote sensing of the high latitude ionosphere
[AD-A147881] N85-16405

AEROSPACE MEDICAL RESEARCH LABS., WRIGHT-PATTERSON AFB, OHIO.
A machine for weight-lift testing
[AD-A146816] N85-16182
Testing changes in visual function due to orbital environment
[AD-A147259] N85-16453

AIR FORCE EASTERN TEST RANGE, PATRICK AFB, FLA.
Lightning research: A user's lament N85-16346

AIR FORCE ENVIRONMENTAL TECHNICAL APPLICATIONS CENTER, SCOTT AFB, ILL.
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Alconbury RAF United Kingdom, parts A-F
[AD-A146913] N85-16384
Revised Uniform Summary of Surface Weather Observations (RUSSWO). McChord AFB, Washington, parts A-F
[AD-A146914] N85-16385
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Mildenhall RAF, United Kingdom, parts A-F
[AD-A146915] N85-16386
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Dobbins AFB, Georgia, parts A-F
[AD-A146916] N85-16387
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Shemya AFB, Alaska, parts A-F
[AD-A146917] N85-16388
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Pope AFB, Fayetteville, North Carolina, parts A-F
[AD-A146918] N85-16389
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Sondestrom AB, Greenland, parts A-F
[AD-A146919] N85-16390
Revised Uniform Summary of Surface Weather Observations (RUSSWO). England AFB, Alexandria, Louisiana, parts A-F
[AD-A146920] N85-16391
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Spangdahlem AB, Germany, parts A-F
[AD-A147166] N85-16392
Limited surface observations climatic summary (LISOCS). Hohenfels, AAF, West Germany
[AD-A147167] N85-16393
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Offutt AFB, Nebraska, parts A-F
[AD-A147183] N85-16394
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Hill AFB, Utah, parts A-F
[AD-A147184] N85-16395
Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F: Homestead AFB, Florida
[AD-A147203] N85-16396
Limited surface observations climatic summary (LISOCS). Camp Casey, Tong Du Chon, Korea
[AD-A147204] N85-16397
Limited surface observatins climatic summary (LISOCS). Ansback AHP, Germany
[AD-A147205] N85-16398
Revised Uniform Summary of Surface Weather Observations (RUSSWO). O'Hare International Airport, Chicago, parts A-F
[AD-A147206] N85-16399

AIR FORCE FLIGHT TEST CENTER, EDWARDS AFB, CALIF.
Interactive Signal Analysis Software (ISAS). User's manual
[AD-A146999] N85-16485

AIR FORCE GEOPHYSICS LAB., HANSCOM AFB, MASS.
C2 sub n (optical) studies in the free atmosphere based on rawinsonde data
[AD-A147307] N85-16332
Snow characterization measurements from SNOW-TWO/Smoke Week 6
[AD-A147423] N85-16402
An evaluation of an advection fog prediction model
[AD-A147436] N85-16403
A propagator expansion method for solving linearized plasma kinetic equations with collisions
[AD-A147524] N85-16640
SWIR and visible atomic emission from laser-produced oxygen and nitrogen plasmas
[AD-A147528] N85-16641

AIR FORCE HUMAN RESOURCES LAB., BROOKS AFB, TEX.
Nondestructive inspection: Improved capabilities of technicians
[AD-A147388] N85-16196
Practice makes perfect
[AD-A147124] N85-16486
Technical order managers handbook: Utilization assessment
[AD-A147579] N85-16604

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.
United States Air force aircraft modification process: A system dynamics analysis
[AD-A146954] N85-15659
Performance evaluation of A-10 aircraft maintenance units and aircraft using constrained facet analysis
[AD-A146955] N85-15660
Parametric estimates of propulsion system maintenance manhours
[AD-A147120] N85-15662
A Q-GERT network simulation model for examining pipeline time in the Navy's J-52 intermediate level jet engine repair cycle
[AD-A147260] N85-15663
An analysis of the technical training of enlisted minuteman missile maintenance personnel
[AD-A147078] N85-15775
Distribution and storage of aviation turbine fuel for military operations in northern Australia
[AD-A147180] N85-15821
A bird strike handbook for base-level managers
[AD-A147928] N85-16008
Development of design and economic parameters for passive solar systems
[AD-A147181] N85-16303
Fate and disposition of trichloroethylene in surface soils
[AD-A147918] N85-16321
Neuro-linguistic programming: Eye movements as indicators of representational systems
[AD-A147541] N85-16454
An analysis of constraints to coordinated tactical crew interaction in the P-3C aircraft
[AD-A147220] N85-16476
The effects of software quality control and baseline management on the acquisition of computer programs
[AD-A147051] N85-16502
A survey and evaluation of software quality assurance
[AD-A147552] N85-16510

Implementation of a constraint machine for prism - A parallel problem solver
[AD-A147844] N85-16512
The effect of assumptions about cost element probability distributions on operating and support cost risk analysis
[AD-A147553] N85-16576
Pion inelastic scattering to the first three excited states of Lithium-6
[AD-A147560] N85-16606
A study of the relationship between user attitudes and the success of the MAJCOM and AFRCE work information management system
[AD-A146956] N85-16671
A simulation model for Air Launched Cruise Missile engine management
[AD-A147018] N85-16672
An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system
[AD-A147121] N85-16673
Feasibility of measuring technical productivity improvements in Air Force Logistics Command depot-level maintenance using the Data Envelopment Analysis (DEA) and Constrained Facet Analysis (CFA) models
[AD-A147329] N85-16676
An appraisal of the USAF Technology Modernization Program
[AD-A147344] N85-16677
An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement
[AD-A147496] N85-16678
Government contract contingent liabilities. The anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] N85-16684
Organizations and information processing: A field study of research and development units within the United States Air Force Systems Command
[AD-A147381] N85-16691

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH, BOLLING AFB, WASHINGTON, D.C.
Research on electroluminescence in thin film yttrium oxysulfide
[AD-A146909] N85-16582

AIR FORCE ROCKET PROPULSION LAB., EDWARDS AFB, CALIF.
An optical and mass spectrometric study of the aluminum-oxygen flame
[AD-A147434] N85-15849

AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AFB, OHIO.
A method for solving the inverse problem of transonic cascade flow
[AD-A146739] N85-15698

AIR FORCE TEST AND EVALUATION CENTER, KIRTLAND AFB, N. MEX.
A total dose characterization of five commercial analog multiplexers
[AD-A146886] N85-15997

AIR FORCE WEAPONS LAB., KIRTLAND AFB, N. MEX.
Infrared presensitization photography
[AD-A146968] N85-16139
SNAP (Space Nuclear Auxiliary Power) reactor overview
[AD-A146831] N85-16612

AIR FORCE WRIGHT AERONAUTICAL LABS., WRIGHT-PATTERSON AFB, OHIO.
Cumulative damage modeling of fatigue crack growth N85-15741
Verification of life prediction through component testing N85-15748
Design and testing of a refractive laser beam homogenizer
[AD-A146997] N85-16162

ALABAMA UNIV., HUNTSVILLE.
Data base support for SIO (System Integration Office)
[AD-A147487] N85-16692

ALABAMA UNIV., UNIVERSITY.
Alabama Tin Belt: Metallogenesis and mineral resource evaluation. Year-end report
[DE84-901335] N85-16283

ALBANY INTERNATIONAL CORP., DEDHAM, MASS.
Flame resistant fibrous materials development
[NASA-CR-167817] N85-15827

AMES LAB., IOWA.
Float zone experiments in space
[NASA-CR-171284] N85-15766

ANALYTICS, INC., DAYTON, OHIO.
Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment
[AD-A147586] N85-16681

ANAMET LABS., INC., SAN CARLOS, CALIF.
A review of imperfection sensitivity of stiffened shells
[AD-A147311] N85-16213

ANGLO-AUSTRALIAN OBSERVATORY, SYDNEY.
Where to next in astronomical photography? N85-16114

APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL, MD.
Ramjets with supersonic combustion N85-15817

APPLIED SCIENCE ASSOCIATES, INC., VALENCIA, PA.
Model of team organization and behavior and team description method
[AD-A147540] N85-16680

ARIZONA UNIV., TUCSON.
LANDSAT-4 Thematic Mapper Modulation Transfer Function (MFT) evaluation
[E85-10055] N85-16250

ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, WATERVLIET, N. Y.
Application of the diffraction model to amorphous magnesium zinc alloys
[AD-A147369] N85-15883

ARMY AVIATION ENGINEERING FLIGHT ACTIVITY, EDWARDS AFB, CALIF.
UH-60A external stores support system fixed provision fairings drag determination
[AD-A147188] N85-15719

ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB., HANOVER, N. H.
Salt action on concrete
[AD-A147812] N85-15912
Pulse transmission through frozen silt
[AD-A147108] N85-15958
Forecasting water temperature decline and freeze-up in rivers
[AD-A147068] N85-16274
Buckling analysis of cracked, floating ice sheets
[AD-A147330] N85-16277
Ice dynamics
[AD-A147376] N85-16278
Effects of low temperatures on the growth and unfrozen water content of an aquatic plant
[AD-A147107] N85-16424

ARMY COMBAT SYSTEMS TEST ACTIVITY (PROVISIONAL), ABERDEEN PROVING GROUND, MD.
ILIR task of digital recoil travel measurement system
[AD-A147102] N85-16140

ARMY COMMAND AND GENERAL STAFF COLL., FORT LEAVENWORTH, KANSAS.
Can the Aggressors continue to be effective in the F-5E?
[AD-A146861] N85-16465

ARMY CONSTRUCTION ENGINEERING RESEARCH LAB., CHAMPAIGN, ILL.
Evaluation of the measured energy performance of four solar systems
[AD-A147912] N85-16306
Project manager's handbook for special projects
[AD-A147913] N85-16683

ARMY ENGINEER TOPOGRAPHIC LABS., FORT BELVOIR, VA.
Diurnal freeze-thaw frequencies in selected regions of the high latitudes
[AD-A147276] N85-16400

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.
Computer program for determining induced stresses and consolidation settlements (CSETT)
[AD-A146730] N85-16493

ARMY MISSILE COMMAND, REDSTONE ARSENAL, ALA.
Interrelationship of atmospheric parameters in Honduras
[AD-A147371] N85-16401

ARMY PROCUREMENT RESEARCH OFFICE, FORT LEE, VA.
Contractor productivity measurement
[AD-A146756] N85-16666

ARMY RESEARCH AND DEVELOPMENT LAB., FORT BELVOIR, VA.
Grease versus oil lubrication of wheel bearings in Army equipment
[AD-A147546] N85-16184
Cooling system investigation of the 3-kW MEP models 016A, 021A, and 026A (60Hz, 400-Hz and 28-V dc) gasoline-engine-driven generator sets
[AD-A147571] N85-16185

ARMY RESEARCH AND TECHNOLOGY LABS., FORT EUSTIS, VA.
US Army helicopter operational flight loads N85-15675

ARMY RESEARCH INST. OF ENVIRONMENTAL MEDICINE, NATICK, MASS.
An atropinized heat-stressed rat model: Dose response effects and pharmacokinetics
[AD-A146851] N85-16423
Carotid baroreceptor influences on peripheral circulatory and thermal responses during cold exposure
[AD-A146808] N85-16447
Comparison of thermal responses between rest and leg exercise in water
[AD-A146818] N85-16448
Effects of restricted water intake on performance in a cold environment
[AD-A146904] N85-16450
Effects of body mass and morphology on thermal responses in water
[AD-A147558] N85-16455

ATLANTA UNIV., GA.
Synthesis and characterization of unique liquid crystalline block copolyesters. A proposal for a polymer research center at the Atlanta University
[AD-A147280] N85-15907

ATMOSPHERIC ENVIRONMENT SERVICE, OTTAWA (ONTARIO).
Climate and water quality N85-16368

AUBURN UNIV., ALA.
The symmetry group and exponents of operator stable probability measures
[AD-A147187] N85-16568

AVCO GOVERNMENT PRODUCTS GROUP, LOWELL, MASS.
Pulsed electric discharge laser technology. Electron beam window foil material
[AD-A147488] N85-16171

AVELEX, SILVER SPRING, MD.
New technology high efficiency and high stability color motion video compression system
[AD-A147523] N85-15968

AVIONS MARCEL DASSAULT, SAINT-CLOUD (FRANCE).
Aeroelastic analysis and the identification of flight loads N85-15679

B

BALL AEROSPACE SYSTEMS DIV., BOULDER, COLO.
Thermal and cryogenic design study for space infrared telescope facility (SIRTF)
[NASA-CR-166613] N85-15793

BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD.
Nonlinear waves in a rod. Results for incompressible elastic materials
[AD-A147485] N85-16216
A virial equation of state option for the TIGER computer program
[AD-A147490] N85-16507
The electronic typesetting program programmer's manual
[AD-A147500] N85-16508

BASEL UNIV. (SWITZERLAND).
Spectrophotometry of cool stars from objective prism spectra N85-16134

BATTELLE COLUMBUS LABS., RESEARCH TRIANGLE PARK, N.C.
A computer program for the performance analysis of scarfed nozzles
[AD-A147370] N85-15730

BATTELLE COLUMBUS LABS., OHIO.
Control technology for integrated circuit fabrication at Micro-Circuit Engineering, Incorporated, West Palm Beach, Florida
[PB85-100717/GAR] N85-16013

BATTELLE INST., FRANKFURT AM MAIN (WEST GERMANY).
Remote sensing of atmospheric gases with CO2 lasers. Continuation and conclusion of spectroscopic investigations
[BMFT-FB-W-84-030] N85-16285

BIONETICS CORP., HAMPTON, VA.
Detection of low frequency impulsive noise from large wind turbine generators
[NASA-CR-172511] N85-16588

BIRMINGHAM UNIV. (ENGLAND).
Ionic reactions of atmospheric importance
[AD-A147354] N85-16333

BOEING AEROSPACE CO., SEATTLE, WASH.
Corrosion properties of second-generation conductive materials N85-16348
Software test handbook
[AD-A146844] N85-16496

BOEING COMMERCIAL AIRPLANE CO., SEATTLE, WASH.
Systems study for an Integrated Digital-Electric Aircraft (IDEA)
[NASA-CR-3840] N85-15714
cost and benefits optimization model for fault-tolerant aircraft electronic systems
[NASA-CR-166043] N85-15993

BOEING MILITARY AIRPLANE DEVELOPMENT, SEATTLE, WASH.
Aircraft wing fuel tank environmental simulator tests for evaluation of antimisting fuels
[FAA-CT-84-15] N85-15920
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
On the long range propagation of sound over irregular terrain
[NASA-CR-3862] N85-16589
BOLT, BERANEK, AND NEWMAN, INC., CANOGA PARK, CALIF.
NOISEMAP 4.4 computer program update, operator's manual, addendum 1
[AD-A147091] N85-16503
BONN UNIV. (WEST GERMANY).
Stellar photographic photometry using a double wedge technique with a focal reducer system N85-16133
BOSTON UNIV., MASS.
Image variance and spatial structure in remotely sensed scenes N85-16265
BRANDEIS UNIV., WALTHAM, MASS.
Correlator and data processing requirements for QUASAT N85-16709
BRITISH AEROSPACE AIRCRAFT GROUP, PRESTON (ENGLAND).
Experiences obtained from service fatigue monitoring exercises N85-15672
Tornado: Structural Usage Monitoring System (SUMS) N85-15680
BRITISH AEROSPACE AIRCRAFT GROUP, STOCKPORT (ENGLAND).
Advanced fatigue monitoring on service aircraft N85-15671
BRITISH GAS CORP., LONDON (ENGLAND).
Strength and aging behaviour of soft soldered joints
[BLL-T6385/BG/WH800/84] N85-15862
Investigation of the creep behaviour of soft soldered joints with solder L-SnAg5 at ambient temperature
[BLL-T6383/BG/WH796/84] N85-15865
NOx emissions near a heat pump with gas motor
[BLL-WH-782-(9091.9F)] N85-16319
BRITISH LIBRARY LENDING DIV., BOSTON SPA (ENGLAND).
Influence of temperatures of reactants on nature of product of solid-phase reactions
[BLL-M-36019-(5828.4)] N85-15832
Influence of size grading of sintering ore on the sintering process
[BLL-M-36004-(5828.4)] N85-15854
The formation of isolated phase precipitates during the decomposition of high-coercive force Fe-Cr-Co alloys
[BLL-M-36028-(5828.4)] N85-15855
Special features of the deformation of molybdenum at high temperatures
[BLL-M-36027-(5828.4)] N85-15856
Thio and seleno compounds of the transition metals with the d (o) configuration
[BLL-MINTEK-TR-1177-(5810.5759)] N85-15863
Microbiological method for the desiliconization of high-silica bauxites
[BLL-MINTEK-TR-1168-(5810.5759)] N85-15864
Influence of pressure on compaction during compression of powders of iron and 40Kh and 10R6MS steels
[BLL-M-35995-(5828.4)] N85-15866
Interaction between chromium oxide and carbon
[BLL-M-36002-(5828.4)] N85-15867
Procedure for investigating high-temperature properties of iron-ore materials
[BLL-M-36020-(5828.4)] N85-15868
The determination of vertical sintering speed of sinter charges
[BLL-M-36033-(5828.4)] N85-15869
Reciprocal solubility of phases in multi-component systems
[BLL-M-36003-(5828.4)] N85-15870
Investigation of granules of molybdenum-base alloys obtained with pulsed discharges
[BLL-M-36012-(5828.4)] N85-15871
Solid-phase sintering of tantalum carbide
[BLL-M-36013-(5828.4)] N85-15872
Kinetics of interaction between carbon and iron oxides of metallized materials in solid phase
[BLL-M-36023-(5828.4)] N85-15873
Test your contacts by measuring their constriction resistance
[BLL-WH-811-(9091.9F)] N85-15978
Instability of film boiling of moving liquids
[BLL-WH-603-(9091.9F)] N85-16056
Analysis of the heating process of a body in a melt
[BLL-M-36014-(5828.4)] N85-16057
Allowing for the temperature field in the wall thickness of checkerwork in thermal calculation
[BLL-M-36015-(5828.4)] N85-16058
Improvement of gas-tightness of OTTG and TBO-5 threaded pipe couplings
[BLL-M-35993-(5828.4)] N85-16175
Damping capacity of multilayer tube during torsion
[BLL-M-36011-(5828.4)] N85-16202
Reliability analysis of local area networks, intermediate report
[BLL-WH-610-(9091.9F)] N85-16520
Use of coordinate functions to calculate deformation fields
[BLL-M-36010-(5828.4)] N85-16524
Calculation of energy of atomization in silicate tetrahedron Si4(4-)
[BLL-M-36000-(5828.4)] N85-16599
Defective nature of the crystalline lattice of nickel ferrite-based solid solutions
[BLL-WH-595-(9091.9F)] N85-16645
BROWN BOVERI RESEARCH CENTER, BADEN (SWITZERLAND).
Experiences with the material bevaviour and high temperature low cycle fatigue life prediction of the IN 738 blading alloy N85-15746
BROWN, BOVERI UND CIE, A.G., MANNHEIM (WEST GERMANY).
Mechanical aspects of high temperature coatings N85-15749
BROWN UNIV., PROVIDENCE, R. I.
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15995
Numerical methods and approximation and modelling problems in stochastic control theory
[AD-A146927] N85-16533
BUENOS AIRES UNIV. (ARGENTINA).
The climate in food production in Latin America N85-16359
BUNDESANSTALT FUER MATERIALPRUEFUNG, BERLIN (WEST GERMANY).
Comparative investigation of testing methods to determine hot crack susceptibility during welding
[BAM-ERP-2415] N85-16218
BUREAU OF MINES, WASHINGTON, D. C.
Geostatistics for resource and reserve estimation
[PB85-105781/GAR] N85-16286

C

CALIFORNIA INST. OF TECH., PASADENA.
Low-loss flexible dielectric waveguide for millimeter-wave transmission and its application to devices
[AD-A147848] N85-16006
X-ray and backscattering analysis of ion implantation phenomena in GaAs and related compounds
[AD-A147449] N85-16659
The compact radio emission regions in active galactic nuclei N85-16713
CALIFORNIA UNIV., BERKELEY.
Gradient polymers
[AD-A146836] N85-15900
Production of hydrogen by cyanobacteria
[PB85-113421/GAR] N85-15925
Control and modeling of a CELSS (Controlled Ecological Life Support System)
[NASA-CR-177324] N85-16472
An algorithm for assembly of stiffness matrices into a compacted data structure
[AD-A146727] N85-16492
Solution of finite element problems by preconditioned conjugate gradient and Lanczos methods
[AD-A146921] N85-16532
Bayesian estimation of undetected errors
[AD-A147198] N85-16545
CALIFORNIA UNIV., IRVINE, DAYTON, OHIO.
Toxic hazards research
[AD-A147857] N85-16425
CALIFORNIA UNIV., LIVERMORE. LAWRENCE LIVERMORE LAB.
Power of deterministic thinking in machine tool accuracy
[DE85-001751] N85-16188
CALIFORNIA UNIV., LOS ANGELES.
Flutter control with unsteady aerodynamic models
[AD-A147858] N85-15753
Structural and synthetic organosilicon chemistry
[AD-A147101] N85-15820
CALIFORNIA UNIV., SANTA BARBARA.
Convection heat transfer in the critical region of fluid mixtures
[DE85-002118] N85-16088
Techniques for vector quantization
[AD-A147052] N85-16539
CALIFORNIA UNIV., SANTA CRUZ.
Dynamical characteristics of weak turbulence
[AD-A147186] N85-16075
CAMBRIDGE UNIV. (ENGLAND).
Some aspects of active galactic nuclei N85-16702
CANADAIR LTD., MONTREAL (QUEBEC).
CF-5 vertical stabilizer flight load survey N85-15673
TUTOR (CL-41A) tail flight load survey N85-15678
CARNEGIE-MELLON UNIV., PITTSBURGH, PA.
Support for distributed transactions in the TABS (Transaction based systems) prototype
[AD-A147213] N85-16486
CASE WESTERN RESERVE UNIV., CLEVELAND, OHIO.
Electronic and redox properties of stacked-ring silicon phthalocyanines from molecular orbital theory
[AD-A147161] N85-15844
Experimental test program for evaluation of solid lubricant coating as applied to compliant foil gas bearings to 315 deg C
[NASA-CR-174837] N85-15895
CENTRE D'ETUDES ET DE RECHERCHES GEODYNAMIQUES ET ASTRONOMIQUES, ST. VALLIER DE THIEY (FRANCE).
SENSIT.FOR: A program for sensitometric reduction N85-16105
CESKOSLOVENSKA AKADEMIE VED, ONDREJOV.
A spectrosensitometer with an absolute calibration N85-16106
CHEMICAL RESEARCH AND DEVELOPMENT CENTER, ABERDEEN PROVING GROUND, MD.
Effect of integration time on precision of absorbances measured with a diode array UV-VIS spectrophotometer
[AD-A146952] N85-16624
CHICAGO UNIV., ILL.
The adsorption of CO and oxygen on Cu layers on a W(110) surface
[AD-A147345] N85-15847
Ambiguity and uncertainty in probabilistic inference
[AD-A147378] N85-16572
CHRYSLER CORP., HUNTSVILLE, ALA.
Improved radiographic viewing system
[AD-A147587] N85-16456
CITY COLL. OF THE CITY UNIV. OF NEW YORK.
Optics of solids (surface related) and effect of surface roughness on MOS
[AD-A146883] N85-15996
COLORADO SCHOOL OF MINES, GOLDEN.
Research of inverse methods to describe the structure of the earth and ocean bottom
[AD-A147082] N85-16541
COLORADO STATE UNIV., FORT COLLINS.
Understanding the high pressure properties of molecular solids and molecular surfaces deposited on hetrogeneous substrates
[NASA-CR-174262] N85-16649
COLORADO UNIV., BOULDER.
Continuity of the null space basis and constrained optimization
[AD-A147038] N85-16536
Trust region methods for minimization
[AD-A147073] N85-16540
COLUMBIAN INST. OF HYDROLOGY, METEOROLOGY AND LAND IMPROVEMENT, BOGOTA.
Use of minicomputers for the formation of hydrological data banks N85-16358
COMISION NACIONAL DE INVESTIGACIONES ESPACIALES, BUENOS AIRES (ARGENTINA).
Education and training for the climate related activities in Latin America and the Caribbean N85-16379
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION, MORDIALOC (AUSTRALIA).
The CSIRO (Australia) atmospheric carbon dioxide monitoring program: Surface data
[CSIRO-TP-8] N85-16324
COMPLERE, INC., PALO ALTO, CALIF.
A scanning laser velocimeter for turbulence research
[NASA-CR-172493] N85-15686
COMPUTER CORP. OF AMERICA, CAMBRIDGE, MASS.
Program visualization: Graphics support for software development
[AD-A146887] N85-16499
Model-model mappings and conversion in a family of data model specifications
[PB84-217124] N85-16518
COMPUTER SCIENCES CORP., SILVER SPRING, MD.
Support for the Naval Research Laboratory Passive Microwave Clutter Analysis Program
[AD-A146771] N85-15951
CONNECTICUT UNIV., STORRS.
Robust prediction and interpolation for vector stationary processes, part 3
[AD-A147860] N85-16579
CONSEJO NACIONAL DE INVESTIGACIONES CIENTIFICAS Y TECHNICAS, BUENOS AIRES (ARGENTINA).
Energy and climate: Problems in Latin America N85-16375

COSTA RICA UNIV., SAN JOSE.
Requirements for training in climate-related subjects N85-16378
CRIMEAN ASTROPHYSICAL OBSERVATORY (USSR).
Astronomical applications of new infrared films N85-16111

D

DAYTON UNIV., OHIO.
Mechanical property data 7050-t736511 alloy [AD-A147385] N85-15682
Description and operation of a thermal decomposition unit-gas chromatographic system [PB84-246362] N85-16146
DEFENCE RESEARCH INFORMATION CENTRE, ORPINGTON (ENGLAND).
The design of high order active RC-filters [DRIC-T-7147] N85-15987
DEPARTMENT OF THE AIR FORCE, WASHINGTON, D.C.
Windblast leg protector assembly [AD-D011376] N85-15700
Powered articulated headrest system [AD-D011353] N85-15710
Aircraft thrust control scheme for terrain following system [AD-D011387] N85-15711
Biodynamic resistant control stick [AD-D011380] N85-15721
Mounting construction for turbine vane assembly [AD-D011395] N85-15723
Erosion-resistant nosetip construction [AD-D011346] N85-15797
Carbon/carbon rocket motor exit cone reinforcement [AD-D011360] N85-15799
Pseudo-p-1,2,2,9,9,10,10-octofluoro (2,2)-p-cyclophane bis-acid chloride [AD-D011393] N85-15818
Gas contamination detection device [AD-D011386] N85-15833
Method for making alloy additions to base metals having higher melting points [AD-D011403] N85-15884
Cryogenic glass-to-metal seal [AD-D011370] N85-15911
Hardwire missile receiver coupler [AD-D011350] N85-15936
Diagnostic apparatus for radar pulse repetition frequency control circuit card [AD-D011364] N85-15938
Holographic directional coupler for fiber optic systems [AD-D011365] N85-15939
Voice command weapons launching system [AD-D011378] N85-15940
EMI (electromagnetic interference) filter capacitor unit [AD-D011392] N85-15941
Parallel processor configuration for adaptive antenna arrays [AD-D011347] N85-15970
Tracking servo compensator with rate aiding [AD-D011372] N85-15971
Dual mode directionally coupled band reject filter apparatus [AD-D011359] N85-15984
Programmable synchronous digital delay line [AD-D011382] N85-15985
Slow wave circuit with shaped dielectric substrate [AD-D011385] N85-15986
Electromechanical switch [AD-D011400] N85-16009
Low noise multiple crystal-controlled oscillator [AD-D011401] N85-16010
Dynamic polymer pressure transducer with temperature compensation [AD-D011373] N85-16142
Method of producing a buried long period grating [AD-D011351] N85-16153
Rippled-field magnetron apparatus [AD-D011354] N85-16154
RF laser array driver apparatus [AD-D011375] N85-16155
Turbulence measurement interferometer apparatus [AD-D011377] N85-16156
Diffusion barrier for long wavelength laser diodes [AD-D011390] N85-16157
Delta wing nozzle assembly for chemical lasers [AD-D011396] N85-16158
Thermally isolated structural support link [AD-D011349] N85-16176
Flexible line support assembly [AD-D011391] N85-16177
Battery control and fault detection method [AD-D011384] N85-16307
Rain rate meter [AD-D011381] N85-16342
Metallic aid and technique in fitting voice prosthesis [AD-D011356] N85-16442
Random pattern tracking acceleration tolerance tester [AD-D011404] N85-16459
Helmet mounted telescope [AD-D011355] N85-16467
Electro-optical target detection [AD-D011366] N85-16617
Unstable optical resonator with cancelling edge waves [AD-D011379] N85-16618
Mirror actuator control system [AD-D011383] N85-16619
Reduction of signal modulation caused by polarization in visible optical scanning systems [AD-D011389] N85-16620
Buried junction enhanced Schottky barrier device [AD-D011399] N85-16635
Two carrier dual injector apparatus [AD-D011357] N85-16646
Combustion chamber floatwall panel attachment arrangement [AD-D011358] N85-16647
Matrix display simulation [AD-D011371] N85-16695
DEPARTMENT OF THE ARMY, WASHINGTON, D. C.
High capacity inorganic oxyhalide electrochemical cell [AD-D011321] N85-15845
Rechargeable lithium cell [AD-D011302] N85-16304
Microwave resonator using lateral excitation [AD-D011374] N85-16596
DEPARTMENT OF THE NAVY, WASHINGTON, D. C.
Polaris guidance system [AD-D011324] N85-15704
System for rapid repair of damaged airfield runways [AD-D011325] N85-15754
Aircraft barricade [AD-D011316] N85-15761
Apparatus for determining the liquid water content of a gas [AD-D011297] N85-15839
Alloys and method of making [AD-D011337] N85-15874
Fluorinated diacrylic esters [AD-D011328] N85-15889
High temperature ultra-high vacuum infrared window seal [AD-D011333] N85-15890
Method for bonding insulator to insulator [AD-D011340] N85-15891
Moisture absorbing anti-arcing coating and method for applying same [AD-D011310] N85-15904
Process for preparation of crosslinked poly(tri-n-butyltin) methacrylate with simultaneous particle size reduction [AD-D011313] N85-15905
Adaptive preprocessing system [AD-D011327] N85-15935
Adaptive MTI (Moving Target Indicator) system [AD-D011361] N85-15937
Transmission line biased coherent array of Josephson oscillators [AD-D011323] N85-15979
Dual band, low sidelobe, high efficiency mirror antenna [AD-D011329] N85-15980
Compact wideband multiple conductor monopole antenna [AD-D011331] N85-15981
Dual-gate MESFET variable gain constant output power amplifier [AD-D011334] N85-15982
Analog to digital converter [AD-D011338] N85-15983
Quasi-optical harmonic gyrotron and gyroklystron [AD-D011308] N85-16001
Electronic module insertion and retraction mechanism [AD-D011309] N85-16002
Laser generation of ultrasonic waveform reconstructions [AD-D011314] N85-16003
Fast granular superconducting bolometer [AD-D011332] N85-16093
Amplitude mode magnetic sensors [AD-D011335] N85-16094
A biological sensor for the detection of toxicants [AD-D011304] N85-16141
Passive maser using timesharing for control of the cavity and control of the oscillator on the line of stimulated emission [AD-D011326] N85-16151
External cavity diode laser sensor [AD-D011341] N85-16152
Visible and ultraviolet lasers based on excimer transitions in the homonuclear halogens [AD-D011311] N85-16163
Phased locked array laser systems [AD-D011317] N85-16164
A new free electron laser using a relativistic beam with spiralling electron [AD-D011318] N85-16165
Multi-directional straddle-lift carrier [AD-D011315] N85-16183
Lightweight, broadband Rayleigh wave transducer [AD-D011345] N85-16584
Superlattice ultrasonic wave generator [AD-D011363] N85-16585
A low perturbation electron injector for cyclic accelerators [AD-D011312] N85-16604
Optical RF downconverter [AD-D011336] N85-16616
Optical fibers with reduced pressure sensitivity to high frequency acoustic field [AD-D011306] N85-16627
An automatic pattern recognition apparatus [AD-D011319] N85-16628
Bragg cell spectrum analyzer specification [AD-D011320] N85-16629
Method of preparing single crystalline cubic silicon carbide layers [AD-D011305] N85-16653
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, BRUNSWICK (WEST GERMANY).
Flight testing of Litton laser gyro strapdown system LTN-90 for general aviation [DFVLR-MITT-84-16] N85-15709
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, COLOGNE (WEST GERMANY).
Experiences with the use of a side-strut model support system for high angles of attack in the Trinsonik wind tunnel TMK [DFVLR-MITT-84-09] N85-15763
Influence of constant amplitude and variable amplitude loading on crack initiation and micro crack propagation in Al 2024-T3 [DFVLR-FB-84-29] N85-16220
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, HARDTHAUSEN (WEST GERMANY).
Nonlinear control model of an H2O steam reactor [DFVLR-FB-84-30] N85-16192
DEUTSCHE LUFTHANSA AKTIENGESELLSCHAFT, FRANKFURT AM MAIN (WEST GERMANY).
Activities report of the aerospace industry in West Germany [ISSN-0722-3838] N85-16686
Activities report of the aerospace industry in West Germany [ISSN-0722-3838] N85-16687
DOMAINE UNIV., SAINT MARTIN D HERES (FRANCE).
The relevance of QUASAT to the star formation problem N85-16718
DREXEL UNIV., PHILADELPHIA, PA.
In-situ stress determination in soil and rock using the acoustic emission method [AD-A147459] N85-16215
DU PONT DE NEMOURS (E. I.) AND CO., AIKEN, S.C.
Residual stresses at small diffusion welds [DE84-014962] N85-16189
DURHAM UNIV. (ENGLAND).
Astronomers' problems with the calibration of Schmidt plates N85-16126

E

EDINBURGH UNIV. (SCOTLAND).
An investigation into the fidelity of reproduction of UKST original objective prism plates on to film N85-16123
A study of structural phase transitions using light scattering techniques [AD-A147261] N85-16654
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
Conjunctive and disjunctive item response functions [AD-A147815] N85-16561
EIDGENOESSISCHES FLUGZEUGWERK, EMMEN (SWITZERLAND).
Six-component strain gage block scale 167-6B. Part 1: Calibration, September 1983 [F+W-FO-1699] N85-16143
ELECTRO MAGNETIC APPLICATIONS, INC., DENVER, COLO.
A comparison of lightning and nuclear electromagnetic pulse response of a helicopter N85-16349
A comparison of lightning and nuclear electromagnetic pulse response of tactical shelters N85-16350

ELECTRONIC SYSTEMS DIV., HANSCOM AFB, MASS.
Efficient computation of optimal time for transaction processing in a database system
[AD-A147568] N85-16693
A simulator for determining the performance of transaction manager and lock manager combinations in a database
[AD-A147827] N85-16696
ELECTROTECHNICAL LAB., IBARAKI (JAPAN).
Study on control of ion engine system
[EL-847] N85-15800
ENGINEERING AND ECONOMICS RESEARCH, INC., VIENNA, VA.
National airspace review: Airport radar service area operational confirmation report
[DOT/FAA/AT-84/2] N85-15707
Upper Atmosphere Research Satellite (UARS) trade analysis
[NASA-CR-175269] N85-15774
ENVIRONMENTAL RESEARCH INST. OF MICHIGAN, ANN ARBOR.
Study of spectral/radiometric characteristics of the Thematic Mapper for land use applications
[E85-10057] N85-16268
Growth/reflectance model interface for wheat and corresponding model
[E85-10058] N85-16269
ERNO RAUMFAHRTTECHNIK G.M.B.H., BREMEN (WEST GERMANY).
Qualification of an electrothermal hydrazine thruster with a vacuum thrust of 0.5 to 2.0 N
[BMFT-FB-W-84-043] N85-15808
EUROPEAN SOUTHERN OBSERVATORY, GARCHING (WEST GERMANY).
Some nonatlas work at the European Southern Observatory (ESO) Sky Atlas Laboratory N85-16117
EUROPEAN SPACE AGENCY, PARIS (FRANCE).
Enhancement of multispectral scanner images by digital filtering
[ESA-TT-624] N85-16284
QUASAT: A VLBI observatory in space
[ESA-SP-213] N85-16700
QUASAT: Technical aspects of the proposed mission N85-16706
EUROSIL G.M.B.H., ECHING (WEST GERMANY).
Development of a 2 micrometer silicon-gate-CMOS-technology for microcomputer oriented VLSI circuits with a supply voltage range between 1.5 and 5 V
[BMFT-FB-T-84-203] N85-16012

F

FEDERAL AVIATION ADMINISTRATION, WASHINGTON, D.C.
National airspace system configuration management interface control document. Maintenance processor subsystem to remote monitoring subsystems and remote monitoring subsystem concentrators
[NAS-MD-790] N85-15705
Helicopter noise survey performed at Las Vegas, Nevada, 19-21 January, 1984
[AD-A147392] N85-16593
Noise measurement flight test: Data-analyses aerospatiale AS-355F TwinStar helicopter
[AD-A147497] N85-16595
FLORIDA STATE UNIV., GAINESVILLE.
A program to produce standard shewhart control charts for the statistics X-bar and R or S, P, NP, C, or U
[AD-A146971] N85-16501
FLORIDA STATE UNIV., TALLAHASSEE.
Ocean and climate, an example. The interannual variability of the tropical Pacific Ocean N85-16365
Interactions between mean flow and finite-amplitude mesoscale eddies in a barotropic ocean
[AD-A147249] N85-16413
Estimation for a semimartingale regression model using the method of sieves
[AD-A146809] N85-16527
On a random difference equation for matrices and a characterization of the gamma distribution
[AD-A146858] N85-16529
FLORIDA UNIV., GAINESVILLE.
FLACS: A new sensitometer for measurement of extreme low intensity reciprocity in a controlled environment N85-16104
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME (ITALY).
The challenge of food production: The importance of climate N85-16361
FORD AEROSPACE AND COMMUNICATIONS CORP., NEWPORT BEACH, CALIF.
Continuum absorption by H2O in the 700-1200 cm(-1) and 2400-260 cm(-1) windows
[AD-A147391] N85-16334
FORD AEROSPACE AND COMMUNICATIONS CORP., PALO ALTO, CALIF.
The 20 GHz proof-of-concept test model results for a multiple scan beam dual reflector antenna
[NASA-CR-174268] N85-15944
FOREST SERVICE, NEW ORLEANS, LA.
Forest area estimates from LANDSAT MSS and forest inventory plot data
[PB85-105617/GAR] N85-16290
FORSCHUNGSINSTITUT DER DEUTSCHEN BUNDESPOST, DARMSTADT (WEST GERMANY).
Improved digital baseband transmission by application of maximum likelihood decoding to an 8-level signal generated by convolution and block coding
[FI-44-TBR-93] N85-15973
Compository speech output (KOSA) with a very large scale integration speech synthesis chip
[FI-13-TBR-18] N85-15974
FOSTER WHEELER CORP., HOUSTON, TEX.
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300
FRAUNHOFER-INST. FUER BETRIEBSFESTIGKEIT, DARMSTADT (WEST GERMANY).
Fatigue strength of different sintered steels and design criteria for porous material (PM) parts
[LBF-FB-170/84] N85-15886
The influence of fastener flexibility on load transfer and fatigue life predictions for multirow bolted and riveted joints
[LBF-FB-172/84] N85-16219
FRAUNHOFER-INST. FUER SOLARE ENERGIESYSTEME, FREIBURG (WEST GERMANY).
Solar energy conversion based on the principle of fluorescent collectors. Installation of a test collector to deliver several Watts power
[BMFT-FB-T-84-192] N85-16308
Solar energy conversion based on the principle of fluorescent collectors
[BMFT-FB-T-84-193] N85-16309

G

GARRETT TURBINE ENGINE CO., PHOENIX, ARIZ.
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300
GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C.
The Air Force can improve its forecasts of aircraft spare parts requirements
[AD-A147911] N85-16682
GENERAL DYNAMICS CORP., FORT WORTH, TEX.
F-16 force management, yesterday, today and tomorrow N85-15674
GENERAL ELECTRIC CO., ARLINGTON, VA.
On the structure of information in software
[AD-A147580] N85-16511
GENERAL ELECTRIC CO., PHILADELPHIA, PA.
Transformation toughened ceramics for the heavy duty diesel engine technology program
[NASA-CR-174689] N85-16698
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
Charge domain filters for enhanced monolithic signal processing
[AD-A147428] N85-15964
Microcomputer control of a residential photovoltaic power conditioning system
[DE84-014774] N85-16488
GENERAL RESEARCH CORP., MCLEAN, VA.
Data appendix: F-number=1.0 EMR with a flexible back electrode
[NASA-CR-172477] N85-15994
GENERAL SEMICONDUCTOR INDUSTRIES, INC., TEMPE, ARIZ.
The ac power line protection for an IEEE 587 Class B environment N85-16347
GEO-CENTERS, INC., NEWTON, MASS.
Ion microscopy of metals and semiconductors
[AD-A147118] N85-16626
GEORGIA INST. OF TECH., ATLANTA.
Two-dimensional signal processing and storage and theory and applications of electromagnetic measurements. Supplemental appendix
[AD-A146848] N85-15953
Monotone operators in mathematical programming
[AD-A147309] N85-16506
GEORGIA TECH RESEARCH INST., ATLANTA.
Infrared technology for satellite power conversion
[NASA-CR-174266] N85-16293
GIBBS AND HILL, INC., NEW YORK.
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines
[NASA-CR-168222] N85-16300
GLOBAL GEOCHEMISTRY CORP., CANOGA PARK, CALIF.
Analysis of gases in the Earth's crust
[PB85-113397/GAR] N85-16287
GRUMMAN AEROSPACE CORP., BETHPAGE, N.Y.
Supersonic nonlinear potential analysis
[NASA-CR-172456] N85-15685
The growth of metastable peritectic compounds
[NASA-CR-171269] N85-15624
The growth of metastable peritectic compounds
[NASA-CR-171290] N85-15625
SPAR X technical report for experiment 76-22 directional solidification of magnetic composites
[NASA-CR-171271] N85-15680
GUELPH UNIV. (ONTARIO).
A complete characterization of triply balanced matrices with applications to survey sampling
[AD-A147063] N85-16542

H

HAMBURGER STERNWARTE (WEST GERMANY).
First tests on the astrometric performance of the new PDS1010G at Hamburg Observatory N85-16135
HAMPTON INST., VA.
Intense excitation source of blue-green laser
[AD-A147450] N85-16168
HARVARD COLL. OBSERVATORY, CAMBRIDGE, MASS.
Research in geodesy based upon radio interferometric observations of extragalactic radio sources
[AD-A147581] N85-16280
HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS, CAMBRIDGE, MASS.
Water masers and distance measurements: The impact of QUASAT N85-16721
HARVARD UNIV., CAMBRIDGE, MASS.
Structural relaxation and isoconfigurational flow of a metallic glass near equilibrium
[AD-A147888] N85-15915
HARVEY LABS., INC., CHARLOTTESVILLE, VA.
Qualitative and quantitative compositional analysis of shale derived by gas chromatography and combined gas Chromatography/Mass spectrometry. Executive summary
[AD-A148369] N85-15851
HONEYWELL, INC., BLOOMINGTON, MINN.
Electrically conducting complexes of poly(3,6-n-methylcarbazolyl methylene)
[AD-A147884] N85-15914
HONEYWELL SYSTEMS AND RESEARCH CENTER, MINNEAPOLIS, MINN.
Rule-based evidence accrual system for image understanding
[AD-A147835] N85-16634
HOUSTON UNIV., TEX.
Nondestructive measurement of bulk residual stresses
[AD-A147063] N85-16211
Bayesian estimation of normal mixture parameters N85-16255
HOWARD UNIV., WASHINGTON, D. C.
Development of short gate FET's
[AD-A147033] N85-15899
The 13C nuclear magnetic resonance in graphite intercalation compounds
[NASA-CR-174261] N85-16601
HUGHES AIRCRAFT CO., LOS ANGELES, CALIF.
Spacecraft system study: A study to define the impact of laser communication systems on their host spacecraft
[NASA-CR-175272] N85-16159
HUGHES HELICOPTERS, CULVER CITY, CALIF.
Study to eliminate ground resonance using active controls
[NASA-CR-166609] N85-15715
HUGHES RESEARCH LABS., MALIBU, CALIF.
Extended performance technology study 30-cm thruster
[NASA-CR-168259] N85-15806
Nonlinear optical studies of rydberg atoms using degenerate four-wave mixing
[AD-A146827] N85-16623
Multiwavelength bidirectional coupler-decouplers
[AD-A147009] N85-16625
Clusters of defects in semiconductors
[AD-A147426] N85-16655
HUGHES (THOMAS J. R.), STANFORD, CALIF.
Finite element procedures applicable to nonlinear analysis of reinforced concrete shell structures
[AD-A146796] N85-16209
HULBURT (E. O.) CENTER FOR SPACE RESEARCH, WASHINGTON, D.C.
Opportunities for high angular and temporal resolutions of galactic objects at radio frequencies N85-16723

HUMAN ENGINEERING LABS., ABERDEEN PROVING GROUND, MD.
Literature review of voice recognition and generation technology for Army helicopter applications
[AD-A146878] N85-15954
HUMAN RESOURCES RESEARCH ORGANIZATION, ALEXANDRIA, VA.
Human factors and training research in military organizations and systems
[AD-A146832] N85-16475
Human factors characteristics of the Joint Tactical Fusion Test Bed: Field test 467 results
[AD-A146856] N85-16476

I

IBM RESEARCH LAB., SAN JOSE, CALIF.
Noncontact photo-thermal probe-beam deflection measurement of thermal diffusivity in an confined hot gas
[AD-A147481] N85-16170
IBM WATSON RESEARCH CENTER, YORKTOWN HEIGHTS, N.Y.
An analytical model of periodic waves in shallow water
[AD-A147501] N85-16085
An analytical model of periodic waves in shallow water
[AD-A147502] N85-16086
ILLINOIS STATE WATER SURVEY, CHAMPAIGN.
In-lake water quality management for Lake Eureka: Highlights of third year (1983) operation
[PB85-104149/GAR] N85-16269
ILLINOIS UNIV., CHICAGO.
A complete characterization of triply balanced matrices with applications to survey sampling
[AD-A147083] N85-16542
ILLINOIS UNIV., URBANA.
Development of a preliminary ALRS stabilized material pavement analysis system (SPAS)
[AD-A147116] N85-15760
MMIC devices for active phased array antennas
[NASA-CR-174281] N85-15943
Investigation of planar waveguides and components for millimeter-wave integrated circuits
[AD-A147380] N85-16005
Studies of the wall shear stress in a turbulent pulsating pipe flow
[AD-A146772] N85-16068
IMPERIAL COLL. OF SCIENCE AND TECHNOLOGY, LONDON (ENGLAND).
Proceedings of the International Conference and Exposition on Structural Impact and Crashworthiness
[AD-A147845] N85-15703
INDIANA UNIV., BLOOMINGTON.
Vibrational spectroscopy of chemisorption phenomena on model catalyst surfaces
[AD-A146753] N85-15840
INDUSTRIEANLAGEN-BETRIEBSGESELLSCHAFT M.B.H., OTTOBRUNN (WEST GERMANY).
Operational loads data evaluation for individual aircraft fatigue monitoring N85-15669
INFORMATICS GENERAL CORP., PALO ALTO, CALIF.
RATFOR user's guide version 2.0
[NASA-CR-166601] N85-16490
INFORMATION SPECTRUM, INC., ARLINGTON, VA.
Technical performance measurement handbook
[AD-A147314] N85-16675
INSTITUTE OF GAS TECHNOLOGY, CHICAGO, ILL.
Identification of leaks: Internal acoustic method, phase 2
[PB85-101947/GAR] N85-15927
INSTITUTO DE PESQUISAS ESPACIAIS, SAO JOSE DOS CAMPOS (BRAZIL).
Integrated analysis of remote sensing products from basic geological surveys
[E85-10052] N85-16248
The management of atmospheric resources in food production N85-16362
The ocean and the dynamics of the tropical atmosphere; its possible predicability N85-16366
The water balance and climate N85-16370
Ecological impacts of hydroelectric projects in Amazonia N85-16374
The Amazon and climate N85-16376
INTEGRAL TECHNOLOGIES, INC., WESTMONT, ILL.
Methods for heat transfer and temperature field analysis of the insulated diesel
[NASA-CR-174783] N85-16699
INTEGRATED CIRCUIT ENGINEERING CORP., SCOTTSDALE, ARIZ.
Facility safety study
[NASA-CR-174280] N85-15759
INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION, OGDEN, UTAH.
Computer program to compute soil thermal conductivity from transient temperature measurements
[PB85-100550] N85-16341
IOWA UNIV., IOWA CITY.
Free-surface boundary layer and the origin of bow vortices
[AD-A147427] N85-16083
Frazil ice formation
[AD-A147425] N85-16279
On the power functions of test statistics in order restricted inference
[AD-A147126] N85-16566
ITT AEROSPACE/OPTICAL DIV., FORT WAYNE, IND.
Stereo Electro-optical Tracking System (SETS)
[NASA-CR-172471] N85-16098

J

JET PROPULSION LAB., CALIFORNIA INST. OF TECH., PASADENA.
Flow of nitrogen-pressurized Halon 1301 in fire extinguishing systems
[NASA-CR-174271] N85-15701
Natural interference phenomena affecting spaceborne receivers
[NASA-CR-174256] N85-15798
Biocatalyzed processes for production of commodity chemicals: Assessment of future research advances for N-butanol production
[NASA-CR-174264] N85-15819
Power transfer from natural emitters to collection apertures at microwave wavelengths
[NASA-CR-174275] N85-15989
Spaceborne receivers: Basic principles
[NASA-CR-174269] N85-15990
Target detection using microwave irradiances from natural sources: A passive, local and global surveillance system
[NASA-CR-174260] N85-15991
Performance characteristics of a battery charger and state-of-charge indicator
[NASA-CR-174273] N85-15992
Texture classification using autoregressive filtering N85-16254
Results of the 1984 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-174270] N85-16294
Multijunction cells for concentrators: Technology prospects
[NASA-CR-174259] N85-16295
Antisoiling technology: Theories of surface soiling and performance of antisoiling surface coatings
[NASA-CR-174274] N85-16296
What should DOE do to help establish voluntary consensus standards for measuring and rating the performance of PV modules?
[NASA-CR-174265] N85-16297
Performance and cost of energy transport and storage systems for dish applications using reversible chemical reactions
[NASA-CR-174263] N85-16298
Demonstration of transparent solar array module design
[NASA-CR-174257] N85-16302
JPL Robotics Laboratory computer vision software library
[NASA-CR-174272] N85-16491
A study on the imaging potential of QUASAT N85-16707
JOHNS HOPKINS UNIV., BALTIMORE, MD.
The galaxy scene and QUASAT N85-16703
JOINT PUBLICATIONS RESEARCH SERVICE, ARLINGTON, VA.
West Europe report: Science and technology
[JPRS-WST-84-039] N85-15929
Method for forming electromagnetic-wave-screening composite N85-15930
All-composite Airbus empennage N85-15931
Composite batteries N85-15932
Fiat, Peugeot introduce integrated robotized engine: CAD used N85-15933
Gallium arsenide compounds tested nondestructively with X-rays N85-15934
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-018] N85-16014
Intrinsic polarization basis of radar target observed by system employing diversity reception N85-16015
New construction principles for oscillator power summing devices N85-16016
Estimation of requirements for acceptable noise radiation level of communication transmitters N85-16017
Formation of radio signals with low out-of-band radiation N85-16018
Digital signal demodulators with single-sideband N85-16019
Precision electrooptical deflector based on corrugated light guide N85-16020
Multichannel electrooptical modulators for digital information storage and processing systems N85-16021
Micro-waveguide transformers of coherent optical signals N85-16022
Transformation of mode composition of circular optical waveguide N85-16023
Optimization piezoelectric transducer width of acousto-optical devices N85-16024
USSR report: Electronics and electrical engineering
[JPRS-UEE-84-017] N85-16025
Nonlinear processing of optical pulse signals N85-16026
Optimization of orientation in navigation by two heavenly bodies N85-16027
Errors of analog of inertial coordinate systems modeled in astronavigation system N85-16028
Use of shanks transformation for speeding up adaptation process in antenna arrays N85-16029
Analysis of threshold effects during estimation of arrival time of optical signals N85-16030
Analysis of effectiveness of partial optimization of spatial processing systems N85-16031
Potential effectiveness of spatial processing in detecting signals against background of interfering reflections N85-16032
Determination of row-and-column control principle of phase antenna array from amplitude-phase distribution of field in aperture N85-16033
Slow surface magnetoplasma waves in oblique magnetic field N85-16034
Structure of frequency modulated and phase-shift keyed signals reflected from ionosphere at near-critical frequencies N85-16035
Dispersion properties of moving ionospheric perturbations N85-16036
Influence of Faraday effect in ionosphere on nonmutuality of meteor radio channel N85-16037
Reflection theorems for some anisotropic media N85-16038
Transformation of electromagnetic waves in plasma with randomly-heterogeneous magnetic field N85-16039
Fluctuations during observations of extraterrestrial sources from outer space through Earth's atmosphere N85-16040
Tolerance synthesis of multilayer radome walls N85-16041
Arc erosion of metal in current interval of 1-10 amperes N85-16042
Art of programming programmable microcalculators. Part 12: Solution of differential equations N85-16043
Diagnosis of insulation defects in 1000+ V distribution networks with insulated neutral N85-16044
Determination of moments of initial estimate during linear approximation of distribution of ejected impurity N85-16045
Dependence of breakdown voltage for p-n junction on parameters of ion implantation and semiconductor heat treatment N85-16046
Determination of parameters of doped thin semiconductor layers from plasmatic minimum of reflection coefficient for infrared radiation N85-16047
Investigation of semiautomatic aircraft control processes employing time redundancy in on-board digital trajectory control computers N85-16048
Digital thermometer with linearizer on slide wire N85-16049
Ensuring required metrological reliability of analog instrument channels by parametric compensation N85-16050
Linear wideband microwave amplifiers for monolithic integrated microcircuits N85-16051
Real-time analysis of space characteristics of microwave electromagnetic pulse fields by means of controllable layer structures N85-16052
Improvement of electromechanical systems by utilization of microelectronic technology N85-16053
Logic elements for systems with variable structure N85-16054
Trends in development of software for computer-aided analysis of large-scale integrated circuits N85-16055
USSR report: Earth sciences
[JPRS-UES-84-008] N85-16223
Automated Lavina collects data on snow N85-16224
Vityaz specialists study human adaptability to ocean depths N85-16225
Maritime prospecting, mining discussed N85-16226
Exploring ocean's mineral wealth N85-16227
Hydrologic characteristics of the Mediterranean and Black Sea N85-16228

Razrezy program research in the tropical Atlantic N85-16229
Khibiny experiment described N85-16230
Microseism level, time variations at Turkmen seismic stations studied N85-16231
General model of earthquakes and the place of warnings in it N85-16232
Earthquake forecasting research in the Ukraine N85-16233
New data on presence of ores in salt dome structures of Dnieper-Donets Basin N85-16234
Deep structure of Western Siberia N85-16235
Model of earthquake mechanism N85-16236
Statistical filtering as method for detecting transcrustal acoustic anomalies N85-16237
Interpreting geothermal anomalies by special points method N85-16238
Satellite photographs suggest arctic volcano N85-16239
Parachute expedition to Arctic N85-16240
USSR report: Energy [JPRS-UEN-84-038] N85-16312
Deputy Minister discusses plans for geothermal power N85-16313
Progress in developing tidal electric power plants reported N85-16314
Geothermal wells drilled in Transcarpathians N85-16315
Versatility of peat emphasized N85-16316
Oil-shale exploration expansion urged N85-16317
Heliostat tested N85-16318
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-015] N85-16416
Establishment of posture and working movements of pilot in air crash enquiries N85-16417
Speech-action interrelationships in operational work N85-16418
Effects of individual mnemonic characteristics on problem solving N85-16419
Mental status in relation to special conditions of activity N85-16420
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-027] N85-16426
Distinctions of SPF rats used in experiments aboard biosatellites N85-16427
Eyes for computers N85-16428
Modeling of human motion by computer considering measurement errors in initial data N85-16429
Variation in photosynthesis with light level for model with two photochemical reactions N85-16430
Effect of microwave radiation on local blood circulation and oxygenation of brain tissue N85-16431
High voltage effects measured on dummy mannequin N85-16432
Natural electrical activity of human sympathetic nerve fibers, recorded from body surface N85-16433
Distribution of blood flow to brain, kidneys, gut, spleen and posterior extremities in cats in acute hypoxia N85-16434
Central regulation of sensory flow in human visual system N85-16435
Lateral specifics of visual perception N85-16436
Visual evoked potentials with disrupted functioning of nonspecific cerebral systems N85-16437
Change in relationship of biopotentials of brain zones for various levels of working capacity N85-16438
Pulmonary blood flow and oxygenation of arterial blood in a healthy subject upon 7 days hypokinesia N85-16439
Specifics of dynamics of brain biopotentials under the influence of complex audible communicative signals N85-16440
Biochemical evaluation of bodily influence of high and low temperatures N85-16441

K

KANSAS UNIV., LAWRENCE.
An investigation of vortex-induced aerodynamic characteristics of supersonic cruise configurations [NASA-CR-174299] N85-15690
Power spectral ensity of markov texture fields N85-16262

KANSAS UNIV. CENTER FOR RESEARCH, INC., LAWRENCE.
Design study of technology requirements for high performance single-propeller-driven business airplanes [NASA-CR-3863] N85-15692
Intermediate results of radar backscatter measurements from summer sea ice [AD-A147212] N85-15960
Design of an analog spectrum analyzer for probing experiments [AD-A147384] N85-15963

KERNFORSCHUNGSANLAGE, JUELICH (WEST GERMANY).
Diffusion in metals under high mechanical strain and acceleration [JUEL-1913] N85-15887
The effect of the test atmosphere on the formation and propagation of creep cracks in commercial high temperature alloys [JUEL-1939] N85-16221

KIGRE, INC., TOLEDO, OHIO.
The development of a high average power glass laser source [AD-A147471] N85-16169

KITT PEAK NATIONAL OBSERVATORY, TUCSON, ARIZ.
Recalibration of the KPNO spot sensitometers N85-16103
Using a Gossen light meter to produce enlarged interpositive film copies from glass plates N85-16118
Unsharp masking at the enlarger N85-16119

L

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY, PALISADES, N. Y.
Arctic marine acoustics [AD-A147492] N85-16594

LASER INST. OF AMERICA, TOLEDO, OHIO.
Laser R and D in the armed services [AD-A146930] N85-16161

LEHIGH UNIV., BETHLEHEM, PA.
A hydrogen partitioning model for hydrogen assisted crack growth [AD-A147385] N85-16214

LETTERMAN ARMY INST. OF RESEARCH, SAN FRANCISCO, CALIF.
Fatal hemorrhagic shock and acetate solutions [AD-A146754] N85-16444

LIFE SYSTEMS, INC., CLEVELAND, OHIO.
Engineering model system study for a regenerative fuel cell: Study report [NASA-CR-174801] N85-16292

LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
Tristatic tracking filter used by the multistatic measurement system [AD-A146885] N85-15769
Solid state research [NASA-CR-174285] N85-16656

LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS.
Preliminary evaluation of a liquid belt radiator for space applications [NASA-CR-174807] N85-15804

LITTLE (ARTHUR D.), INC., SANTA MONICA, CALIF.
Advanced technology cogeneration system conceptual design study: Closed cycle gas turbines [NASA-CR-168222] N85-16300

LNK CORP., SILVER SPRING, MD.
Analysis of subpixel registration N85-16267

LOCKHEED-CALIFORNIA CO., BURBANK.
Integrated technology wing study (oral presentation) [NASA-CR-169497] N85-15718
Evaluation of the alkaline peroxide pre-bond surface treatment for titanium [AD-A147352] N85-15881

LOCKHEED ENGINEERING AND MANAGEMENT SERVICES CO., INC., HOUSTON, TEX.
Columbia: The first 5 flights entry heating data series. Volume 1: An overview [NASA-CR-171820] N85-15777

LOCKHEED MISSILES AND SPACE CO., HUNTSVILLE, ALA.
High altitude chemically reacting gas particle mixtures. Volume 1: A theoretical analysis and development of the numerical solution [NASA-CR-171826] N85-15801
High altitude chemically reacting gas particle mixtures. Volume 2: Program manual for RAMP2 [NASA-CR-171827] N85-15802
High altitude chemically reacting gas particle mixtures. Volume 3: Computer code user's and applications manual [NASA-CR-171828] N85-15803
Bearing tester fit analysis [NASA-CR-171282] N85-16181
Investigation of the HPFTP first stage impeller crack [NASA-CR-171281] N85-16208

LOCKHEED MISSILES AND SPACE CO., PALO ALTO, CALIF.
On-orbit support of DARPA-301 payload [AD-A146897] N85-15767
Pointing and control system design study for the space infrared telescope facility (SIRTF) [NASA-CR-166612] N85-15795

LOCKHEED MISSILES AND SPACE CO., SUNNYVALE, CALIF.
Demonstration of transparent solar array module design [NASA-CR-174257] N85-16302

LOGISTICS MANAGEMENT INST., WASHINGTON, D. C.
Life cycle cost management master plan for the Defense Communications Agency [AD-A146878] N85-16668
Acquisition planning at the Defense Communications Agency [AD-A146877] N85-16669

M

MANCHESTER UNIV. (ENGLAND).
Job and family stress as predictors of pilot health, job satisfaction and performance [AD-A142176] N85-16464

MARINE RESEARCH INST., HELSINKI (FINLAND).
Investigation of the ice dynamics in the marginal ice zone [AD-A146729] N85-16411

MARQUARDT CORP., VAN NUYS, CALIF.
Ramjet air induction system design for tactical missile application N85-15811

MARTIN MARIETTA LABS., BALTIMORE, MD.
Algal culture studies related to a Closed Ecological Life Support System (CELSS) [NASA-CR-177322] N85-16470

MARYLAND UNIV., COLLEGE PARK.
Evidence accumulation for spatial reasoning N85-16261
Analysis of subpixel registration N85-16267
Functional semantics of modules [AD-A146923] N85-16500
Debug testing and confidence testing [AD-A147104] N85-16504
Feedback, adaptivity and A-posterior estimates in finite elements: Aims, theory and experience [AD-A146869] N85-16531
Performance of the h, p and h-p versions of the finite element method [AD-A146940] N85-16535

MASSACHUSETTS COMPUTER ASSOCIATES, INC., WAKEFIELD.
NSW (National Software Works) lessons learned [AD-A146737] N85-16494

MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
Thermal-mechanical fatigue crack growth in Inconel X-750 [NASA-CR-174740] N85-15877
Silazane precursors to silicon nitride [AD-A146791] N85-15899
Computational analysis of scramjet dual mode operation [NASA-CR-174250] N85-16060
Current problems in turbomachinery fluid dynamics [AD-A147127] N85-16074
Vision by man and machine: How the brain processes visual information may be suggested by studies in computer vision (and vice versa) [AD-A147890] N85-16458
Feasibility of producing a range of food products from a limited range of undifferentiated major food components [NASA-CR-177329] N85-16473
Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] N85-16474
What a parallel programming language has to let you say [AD-A147854] N85-16513
Some scientific subroutines in LISP [AD-A147889] N85-16515
Surface reconstruction preserving discontinuities [AD-A146741] N85-16526
Forces on neutral atoms due to electromagnetic fields [AD-A146984] N85-16603
Switchable zero order diffraction gratings as light valves [AD-A147575] N85-16633
Explosive emission cathode plasmas in intensive relativistic electron beam diodes [AD-A147917] N85-16642
On the complexity of distributed decision problems [AD-A147174] N85-16674
QUASAT, gravitational lenses, and studies of the interstellar, intracluster and intergalactic medium N85-16715

MASSACHUSETTS UNIV., AMHERST.
The mineralogy of global magnetic anomalies
[E85-10061] N85-16272
Study of infrared atmospheric emission
[AD-A147517] N85-16336
Decentralized control of scheduling in distributed systems
[AD-A147446] N85-16487
Decentralized control of scheduling in distributed systems
[AD-A147445] N85-16523
An operator method for computing the asymptotics of a collision-resolution interval
[AD-A146837] N85-16526
MAX-PLANCK-INST. FUER RADIOASTRONOMIE, BONN (WEST GERMANY).
Very Long Base Interferometry (VLBI) in space and X-ray observations of compact sources in active galactic nuclei N85-16716
MCDONNELL AIRCRAFT CO., ST. LOUIS, MO.
The F-15 flight loads tracking program N85-15666
Display Techniques for Advanced Crew Stations (DTACS). Phase 1: Display techniques study
[AD-A146922] N85-15722
MCDONNELL-DOUGLAS CORP., LONG BEACH, CALIF.
Some important problems in unsteady boundary layers including separation. 2: Unsteady boundary layers close to the stagnation region of slender bodies
[AD-A146964] N85-16069
Some important problems in unsteady boundary layers including separation. 1: Nature of singularity on oscillating airfoils
[AD-A147697] N85-16087
MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., BREMEN (WEST GERMANY).
Evaluation of operational loads to verify structural design N85-15677
MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., MUNICH (WEST GERMANY).
Ramjet and Ramrocket Propulsion Systems for Missiles: Introduction and overview N85-15810
Solid propellant Ramrockets N85-15816
MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., TOULOUSE (FRANCE).
Structural flight load measurement demonstration of structural integrity N85-15670
METECH, INC., ELVERSON, PA.
The replacement of precious metal thick film inks using conductive polymer technology. Phase 1: Feasibility study
[AD-A147814] N85-15913
MICHIGAN UNIV., ANN ARBOR.
Some characteristics of automotive gasolines and their performance in a light aircraft engine
[FAA-CT-84-12] N85-15919
New aspects of thermoelastic contact
[AD-A147554] N85-16217
MINISTRY OF DEFENCE, LONDON (ENGLAND).
Operational loads measurement: A philosophy and its implementation N85-15665
MINISTRY OF WORKS, GEORGETOWN (GUYANA).
The use of hydrometeorological data in explaining shrimp cycles in Guyana N85-16381
MISSISSIPPI STATE UNIV., MISSISSIPPI STATE.
Convection schemes for use with curvilinear coordinate systems: A survey
[AD-A147093] N85-16543
MISSISSIPPI UNIV., UNIVERSITY.
Study of optical sound generation and amplification
[AD-A147359] N85-16592
MORGAN STATE UNIV., BALTIMORE, MD.
The calibration of photographic and spectroscopic films: A densitometric analysis of IIaO film flown aboard the Space Shuttle 3
[NASA-CR-174278] N85-16101
MOTOREN- UND TURBINEN-UNION MUENCHEN G.M.B.H. (WEST GERMANY).
In-flight evalution of LCF life consumption of critical rotor components subjected to high transient thermal stress N85-15734
Comparison between the properties of conventional wrought and powder metallurgical alloys for turbine disc applications N85-15739
Repair welding and brazing procedures for turbine components and investigation of the brazing behavior of thin filler foils
[MTU-TB-908/84] N85-16190
Welding of PM-superalloys
[MTU-TB-910/84] N85-16191
Possibilities for a more accurate life prediction of components N85-16198
MUENSTER UNIV. (WEST GERMANY).
Plate measurements and reductions at Muenster N85-16129
MULLARD RADIO ASTRONOMY OBSERVATORY, CAMBRIDGE (ENGLAND).
Testing theories of superluminal motion N85-16714

N

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
Earth science investigations in the United States Antarctic Research Program (USARP)
[PB84-240506] N85-16288
NATIONAL AERONAUTICAL ESTABLISHMENT, OTTAWA (ONTARIO).
Problems and possibilities for life extension in gas turbine components N85-15742
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
Unsteady flow characteristics in the near-wake of a two-dimensional obstacle
[NASA-TM-77762] N85-15684
Installed nacelle drag-improvement tests of an M = 0.8 turboprop transport configuration
[NASA-TM-84302] N85-15716
BDLI memorandum on the future of space flight in the Federal Republic of Germany
[NASA-TM-77624] N85-15765
Ion thruster project
[NASA-TM-77726] N85-15805
Unidirectional fibers and polyurethane elastomer matrix based composites synthesis and properties
[NASA-TM-77501] N85-15826
Reactions of butadiyne. 1: The reaction with hydrogen atoms
[NASA-TM-77805] N85-15834
The anode mechanism of a thermal argon arc
[NASA-TM-77754] N85-15835
Study of the liquid vapor equilibrium in the bromine-hydrobromic acid-water system
[NASA-TM-77787] N85-15836
The discharge mechanism of the high-temperature arc
[NASA-TM-77794] N85-15837
Studies on copper alloys containing chromium on the copper side phase diagram
[NASA-TM-77752] N85-15876
On heat-treatable copper-chromium alloy, 1
[NASA-TM-77753] N85-15879
Oxidation resistance of silicon ceramics
[NASA-TM-77429] N85-15898
Axisymmetric electromagnetic field influence on the characteristic velocity of an arc-jet
[NASA-TM-77475] N85-15942
Gas pressure and electron density in the active zone level of hollow cathode arc discharges
[NASA-TM-77468] N85-15988
Clearance flow-generated transverse forces at the rotors of thermal turbomachines
[NASA-TM-77292] N85-16180
Back stress in dislocation creep. Part 1: Basic concepts and measuring techniques
[NASA-TM-77773] N85-16206
Measurement of high temperature strain by the laser-speckle strain gauge
[NASA-TM-77751] N85-16207
Development of large wind energy power generation system
[NASA-TM-77779] N85-16301
The lipid composition and its alteration during the growth stage in pathogenic fungus, epidermophyton floccosum
[NASA-TM-77440] N85-16421
The development of the vestibular apparatus under conditions of weightlessness
[NASA-TM-77517] N85-16422
High-power radiating plasma
[NASA-TM-77784] N85-16637
Electronic structure and properties of magnetic defects in Co(1+x)Al(1-x) and Fe(1+x)Al(1-x) alloys
[NASA-TM-77498] N85-16648
The management of research institutions: A look at government laboratories
[NASA-SP-481] N85-16665
Outer space law: A problem of astronautics
[NASA-TM-77760] N85-16697
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. AMES RESEARCH CENTER, MOFFETT FIELD, CALIF.
Ground-effect analysis of a jet transport airplane
[NASA-TM-85920] N85-15687
Downwash in the plane of symmetry of an elliptically loaded wing
[NASA-TP-2414] N85-15693
F-8 refueling boom ground vibration test
[NASA-TM-84914] N85-15713
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729
More than you want to know about maximum likelihood estimation
[NASA-TM-85905] N85-15752
The Western Aeronautical Test Range of NASA Ames Research Center
[NASA-TM-85924] N85-15756
SIRTF: The next step
[NASA-TM-86663] N85-16724
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. HUGH L. DRYDEN FLIGHT RESEARCH CENTER, EDWARDS, CALIF.
Predicted performance benefits of an adaptive digital engine control system of an F-15 airplane
[NASA-TM-85916] N85-15729
More than you want to know about maximum likelihood estimation
[NASA-TM-85905] N85-15752
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. EARTH RESOURCES LABS., BAY ST. LOUIS, MISS.
Relationship between forest clearing and biophysical factors in tropical environments: Implications for the design of a forest change monitoring approach
[E85-10051] N85-16247
The influence of the number of ground control points on the scene-to-map registration accuracy N85-16264
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.
Simultaneous ocean cross-section and rainfall measurements from space with a nadir-pointing radar
[NASA-TM-86167] N85-16273
Polar rain: Solar coronal electrons in the Earth's magnetosphere
[NASA-TM-86150] N85-16726
The galactic gamma-ray distribution: Implications for galactic structure and the radial cosmic ray gradient
[NASA-TM-86173] N85-16729
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEX.
Space Station truss structures and construction considerations
[NASA-TM-86338] N85-15796
Estimating location parameters in a mixture N85-16252
Calibration or inverse regression: Which is appropriate for crop surveys using LANDSAT data? N85-16260
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. JOHN F. KENNEDY SPACE CENTER, COCOA BEACH, FLA.
Research and technology, 1984 report
[NASA-TM-83096] N85-16730
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, HAMPTON, VA.
Effects of body shape on the aerodynamics of a body of revolution at Mach numbers from 1.6 to 4.6
[NASA-TM-86345] N85-15657
Loads and Aeroelasticity Division research and technology accomplishments for FY 1984 and plans for FY 1985
[NASA-TM-86356] N85-15691
A comparative study of the nonuniqueness problem of the potential equation
[NASA-TP-2385] N85-15694
Aileron effectiveness for a subsonic transport model with a high-aspect-ratio supercritical wing
[NASA-TM-85674] N85-15695
An exploratory study of finite difference grids for transonic unsteady aerodynamics
[NASA-TM-84583] N85-15696
Comparison of analytical and experimental steadyand unsteady-pressure distributions at Mach number 0.78 for a high-aspect-ratio supercritical wing model with oscillating control surfaces
[NASA-TM-84589] N85-15697
Description of the insulation system for the Langley 0.3-Meter Transonic Cryogenic Tunnel
[NASA-TM-86274] N85-15755
Effect of aerodynamic and angle-of-attack uncertainties on the May 1979 entry flight control system of the Space Shuttle from Mach 8 to 1.5
[NASA-TP-2365] N85-15778
Space Station truss structures and construction considerations
[NASA-TM-86338] N85-15796
Evaluation of colorless polyimide film for thermal control coating applications
[NASA-TM-86341] N85-15894
Numerical studies of interacting vortices
[NASA-TM-86325] N85-16062
On the instability of a 3-dimensional attachment line boundary layer: Weakly nonlinear theory and a numerical approach
[NASA-CR-172504] N85-16063

Existence and non-uniqueness of similarity solutions of a boundary layer problem
[NASA-CR-172503] N85-16064
Laminar heat-transfer distributions on biconics at incidence in hypersonic-hypervelocity flows
[NASA-TP-2213] N85-16065
Reduction method for thermal analysis of complex aerospace structures
[NASA-TP-2373] N85-16066
International Aerospace and Ground Conference on Lightning and Static Electricity. 1984 technical papers. Supplement
[NASA-CP-2356] N85-16343
Upset susceptibility study employing circuit analysis and digital simulation N85-16344
Data and results of a laboratory investigation of microprocessor upset caused by simulated lightning-induced analog transients N85-16345
Research in applied mathematics, numerical analysis, and computer science
[NASA-CR-172505] N85-16480
Solution of partial differential equations on vector and parallel computers
[NASA-CR-172500] N85-16525
Spline methods for approximating quantile functions and generating random samples
[NASA-TP-2389] N85-16565
Aeroacoustic data for high Reynolds number supersonic axisymmetric jets
[NASA-TM-86296] N85-16587
The (20)Ne interaction in extended matter
[NASA-TM-86312] N85-16728

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LEWIS RESEARCH CENTER, CLEVELAND, OHIO.
Temperature distortion generator for turboshaft engine testing
[NASA-TM-83748] N85-15658
Analytical modeling of circuit aerodynamics in the new NASA Lewis wind tunnel
[NASA-TM-86912] N85-15688
Unsteady pressure measurements on a biconvex airfoil in a transonic oscillating cascade
[NASA-TM-86914] N85-15689
The UH-1H helicopter icing flight test program: An overview
[NASA-TM-86925] N85-15702
Effect of steady-state temperature distortion on inlet flow to a high-bypass-ration turbofan engine
[NASA-TM-86896] N85-15725
Integrating chemical kinetic rate equations by selective use of stiff and nonstiff methods
[NASA-TM-86923] N85-15726
Experimental study of the spray characteristics of a research airblast atomizer
[NASA-TM-86911] N85-15727
Engine cyclic durability by analysis and material testing N85-15744
Analytical and physical modeling program for the NASA Lewis Research Center's Altitude Wind Tunnel (AWT)
[NASA-TM-86919] N85-15757
The NASA Altitude Wind Tunnel (AWT): Its role in advanced icing research and development
[NASA-TM-86920] N85-15758
Characterization of MMIC devices for active array antennas
[NASA-TM-86907] N85-15779
A study of interply layer effects on the free-edge stress field of angleplied laminates
[NASA-TM-86924] N85-15822
Design procedures for fiber composite structural components: Panels subjected to combined in-plane loads
[NASA-TM-86909] N85-15823
Optimization of the NiCrAl-Y/ZrO-Y2O3 thermal barrier system
[NASA-TM-86905] N85-15878
Fundamental tribological properties of ceramics
[NASA-TM-86915] N85-15893
Surface effects of corrosive media on hardness, friction, and wear of materials
[NASA-TM-83711] N85-15896
Contact angle and surface tension measurements of a five-ring polyphenyl ether
[NASA-TM-86927] N85-15897
High temperature thermocouple and heat flux gauge using a unique thin film-hardware hot juncture
[NASA-TM-86898] N85-16096
Effect of five lubricants on life of AISI 9310 spur gears
[NASA-TP-2419] N85-16099
Integrated exhaust gas analysis system for aircraft turbine engine component testing
[NASA-TP-2424] N85-16100
Experimental compliance calibration of the NASA Lewis Research Center Mode 2 fatigue specimen
[NASA-TM-86906] N85-16205
Shutdown characteristics of the Mod-O wind turbine with aileron controls
[NASA-TM-86918] N85-16299
Computer program for calculation of complex chemical equilibrium compositions and applications. Supplement 1: Transport properties
[NASA-TM-86885] N85-16663

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.
Natural environmental criteria for the space station definition and preliminary design, revised
[NASA-TM-86460] N85-15773
Atmospheric environment for Space Shuttle (STS-41G) launch
[NASA-TM-86486] N85-16320
An evaluation and comparison of vertical profile data from the VISSR Atmospheric Sounder (VAS)
[NASA-TP-2425] N85-16351

NATIONAL AEROSPACE LAB., AMSTERDAM (NETHERLANDS).
Structural load measurements on a Northrop NF-5A N85-15667
Overview of the AGARD SMP activities on turbine engine materials technology in the 1972 - 1982 period N85-15738
Design criteria for small wind turbines
[NLR-MP-83054-U] N85-16310
Verification of the fatigue properties of (small) wind turbines
[NLR-MP-83055-U] N85-16311

NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
Thermal and mechanical properties of polyurethane foams and a survey of insulating concretes at cryogenic temperatures
[PB85-100949/GAR] N85-15918
NBS (National Bureau of Standards) and WR62 and WR90 reference noise standards
[PB84-235704] N85-15977
NBS (National Bureau of Standards) switching radiometers
[PB84-235894] N85-16147

NATIONAL BUREAU OF STANDARDS, GAITHERSBURG, MD.
Application of quantum chemistry of atmospheric chemistry
[AD-A147035] N85-15843

NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
Finite difference calculations of buoyant convection in an enclosure. Part 2: Verification of the nonlinear algorithm
[PB85-104065/GAR] N85-16069
Numerical solutions for steady natural convection in a square cavity
[PB84-245752] N85-16090
National Bureau of Standards passive solar test facility: Instrumentation and site handbook
[PB85-100451/GAR] N85-16148
Document interchange format
[PB84-217033] N85-16517
FORTRAN version of the quantitative energy-dispersive electron beam X-ray analysis program FRAME C
[PB84-240936] N85-16519
NBS (National Bureau of Standards) daylight availability database
[PB84-245745] N85-16688

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLO.
Climate and fisheries: A Peruvian case study N85-16373

NATIONAL INST. OF METEOROLOGY, BRASILIA (BRAZIL).
The potential contributions of the World Climate Program (WCP) to the economies of developing countries N85-16371

NATIONAL INST. OF HEALTH, BETHESDA, MD.
Evaluation of the musculoskeletal diseases program
[PB84-230648] N85-16461

NATIONAL METEOROLOGICAL CENTER, WASHINGTON, D.C.
Climate applications: General N85-16355
Meteorological aspects of the 1982-83 El Nino/southern oscillation episode N85-16356

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, MIAMI, FLA.
NOAA (National Oceanic and Atmospheric Administration) Aircraft Satellite Data Link (ASDL)
[PB84-243773] N85-15976

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, OAK RIDGE, TENN.
Deciduous forest radiation regimes: Effects of forest structure, phenology and Earth-Sun geometry upon their spatial, temporal and spectral variability
[AD-A148604] N85-16327

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, WASHINGTON, D. C.
Oceanographic data for development of the US exclusive economic zone
[PB85-106458/GAR] N85-16415

NATIONAL PARK SERVICE, WASHINGTON, D. C.
Man in Space: National Historic Landmark Theme Study
[PB85-107233/GAR] N85-15788

NATIONAL RADIO ASTRONOMY OBSERVATORY, CHARLOTTESVILLE, VA.
Potential affiliate stations to work with the EVN N85-16708

NATIONAL WEATHER SERVICE, SALT LAKE CITY, UTAH.
The 500 millibar sign frequency teleconnection charts: Winter
[PB85-106276/GAR] N85-16410

NAVAL AIR DEVELOPMENT CENTER, WARMINSTER, PA.
Navy operational loads data sources and systems N85-15668
Analysis of the flow field about a T-45 using PANAIR
[AD-A146811] N85-15699

NAVAL BIODYNAMICS LAB., NEW ORLEANS, LA.
Nicholet MED-80 (trademark) programs in the Naval Biodynamics Laboratory evoked potential series
[AD-A147105] N85-16451

NAVAL CIVIL ENGINEERING LAB., PORT HUENEME, CALIF.
Hangar heating and energy conservation manual
[AD-A147893] N85-15762
Laboratory investigation on adhesives for Naval facilities construction
[AD-A147453] N85-15909
Interactive color-graphics interface for energy monitoring and control systems
[AD-A147538] N85-16509

NAVAL MEDICAL RESEARCH INST., BETHESDA, MD.
Pathogenesis and treatment of cerebral air embolism and associated disorders
[AD-A146723] N85-16443
Induction of immunity to toxins with anti-idiotypic antibody
[AD-A146793] N85-16445

NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY, BAY ST. LOUIS, MISS.
Bio-optical variability in the Alboran Sea as assessed by Nimbus-7 coastal zone color scanner
[AD-A147909] N85-16281
Satellite definition of the bio-optical and thermal variation of coastal eddies associated with the African current
[AD-A147910] N85-16282

NAVAL OCEAN SYSTEMS CENTER, SAN DIEGO, CALIF.
VOTAN V5000 speech recognition system performance test report
[AD-A146726] N85-15950
Military vital sign monitor
[AD-A147257] N85-16452

NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF.
Control system design language implementation of a gas turbine starting controller
[AD-A147896] N85-15732
Heat transfer due to film condensation on vertical fluted tubes
[AD-A147258] N85-16079
Experiments in forecasting atmospheric marine horizontal visibility using model output statistics with conditional probabilities of discretized parameters
[AD-A147574] N85-16404
Future database machine architectures
[AD-A146786] N85-16481
A note on using the integrated form of ARIMA forecasts
[AD-A146965] N85-16536
Extracting embedded generalized networks from linear programming problems
[AD-A147565] N85-16558
Pari-mutuel as a system of aggregation of information
[AD-A147210] N85-16570
Principles of multiobjective optimization
[AD-A147520] N85-16679

NAVAL RESEARCH LAB., WASHINGTON, D. C.
Radar echo enhancement using surface reflections
[AD-A146970] N85-15955
Array sidelobes, error tolerance, gain, and beamwidth
[AD-A147004] N85-15956
Distributed reservation-based code division multiple access
[AD-A147007] N85-15957
Synoptic observations of the radio noise background in the frequency range 150-180 kHz to provide design data for the low frequency communications designer
[AD-A147438] N85-15965

Radar frequency selection strategies
[AD-A147493] N85-15967
Free surface effects on the wake of a flat plate
[AD-A146988] N85-16071
Self-generated magnetic fields and thermal flux inhibition
[AD-A147405] N85-16166
Thermal evaporation in blast waves: A model for aneurism formation in the NRL (Naval Research Laboratory) LASER-HANE simulation experiment
[AD-A147006] N85-16210
The role of finite parallel length on the stability of barium clouds
[AD-A146972] N85-16328
Region 1 birkeland currents from a global MHD simulation of the magnetosphere
[AD-A147435] N85-16335
Ionospheric turbulence: Interchange instabilities and chaotic fluid behavior
[AD-A147810] N85-16337
Conditions governing the formation of stratocumulus clouds over the western Atlantic during cold air outbreaks
[AD-A146780] N85-16383
Liposome-encapsulated hemoglobin for emergency resuscitation
[AD-A146794] N85-16446
PLOT3D: An interactive graphics code for 3-dimensional plots
[AD-A147887] N85-16514
The 13C nuclear magnetic resonance in graphite intercalation compounds
[NASA-CR-174261] N85-16601
Longer-scalelength plasma perturbations by an intense laser beam
[AD-A147005] N85-16638
Electrostatic wave observation during a space simulation Beam-Plasma-Discharge (BPD)
[NASA-CR-174286] N85-16639

NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, BETHESDA, MD.
Circulation control: A bibliography of DTNSRDC research and selected outside references: Update
[AD-A146966] N85-15661
Bulk cavitation caused by a plane shock wave
[AD-A147031] N85-16072

NAVAL SURFACE WEAPONS CENTER, WHITE OAK, MD.
Safety evaluation of an electronic totalizer containing a Li/(CF)x cell
[AD-A147306] N85-16305

NAVAL WEAPONS CENTER, CHINA LAKE, CALIF.
Coso Monitoring Program, January 1981 through December 1983
[AD-A147894] N85-16338

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY, NATICK, MASS.
Flame-resistant materials for use in pyrotechnic safety clothing
[AD-A146857] N85-15901

NAVY EXPERIMENTAL DIVING UNIT, PANAMA CITY, FLA.
Evaluation of the Kerie Cable thermal arc cutting equipment
[AD-A147813] N85-16186

NETHERLANDS FOUNDATION FOR RADIO ASTRONOMY, DWINGELO.
The QUASAT mission: An overview N85-16704

NEW HAMPSHIRE UNIV., DURHAM.
Laser spectroscopy of alkali atom-tetrahaloethylene reactions
[AD-A147431] N85-15848
Problems associated with the utilization of algae in bioregenerative life support systems
[NASA-CR-166615] N85-16469

NEW MEXICO UNIV., ALBUQUERQUE.
A general theory of circuit analogy in fracture diagnosis
[AD-A147177] N85-16212

NEW TECHNOLOGY, INC., HUNTSVILLE, ALA.
Atmospheric Modeling And Sensor Simulation (AMASS) study
[NASA-CR-171283] N85-16325

NEW YORK UNIV., NEW YORK.
NYU Ada/Ed user's guide: Version 1.4 for VAX/VMS systems
[AD-A146759] N85-16495
Ocean acoustics
[AD-A147062] N85-16591
Theoretical studies relating to the interaction of radiation with matter: Atomic collision processes occurring in the presence of radiation fields
[AD-A146854] N85-16602

NICOLAUS COPERNICUS UNIV., TORUN (POLAND).
The Torun measuring system for astronomical spectra N85-16130

NIJMEGEN UNIV. (NETHERLANDS).
The Malin effect in stellar photography N85-16131

NORTH CAROLINA STATE UNIV., RALEIGH.
Structural optimization and other large-scale processes
[AD-A147895] N85-16564

NORTH CAROLINA UNIV., CHAPEL HILL.
Analytic and sequential feynman integrals on abstract Wiener and Hilbert spaces, and A Cameron-Martin formula. Revision
[AD-A146969] N85-16537
Conditional regression models for transient state survival analysis
[AD-A147872] N85-16563
The symmetry group and exponents of operator stable probability measures
[AD-A147187] N85-16568
Limiting distributions of functionals of Markov chains
[AD-A147832] N85-16577
Local dependence and point processes of exceedances in stationary sequences
[AD-A147859] N85-16578
Infinite order autoregressive representations of multivariate stationary stochastic processes
[AD-A147863] N85-16580
A non-commutative quasi subadditive ergodic theorem
[AD-A146810] N85-16581

NORTHWESTERN UNIV., EVANSTON, ILL.
Polyphosphazene solid electrolytes
[AD-A147008] N85-15902
Theory and applications of two-photon quantum optics
[AD-A147382] N85-16631

O

OAK RIDGE NATIONAL LAB., TENN.
Design of ordered intermetallic alloys for high-temperature structural use
[DE85-000897] N85-15885
Dispersed metal-toughened ceramics and ceramic brazing
[NASA-CR-174284] N85-15916
Simulating responses to expected climate change in eastern North America: Applications to decision-making in the forest industry
[DE85-001272] N85-16406
Chaos near the Coulomb Barrier: Nuclear molecules
[DE85-001280] N85-16608
Comments on the image contrast from inelastically scattered electrons
[DE85-000899] N85-16609
Electron spectrometry experiments with the use of synchrotron radiation
[DE85-001286] N85-16610
Experimental results on Tokamak beta limits from ISX-B
[DE84-015372] N85-16644

OAK RIDGE Y-12 PLANT, TENN.
Ultrasonic analysis of spherical composite test specimens
[DE85-001591] N85-16197
Use of the analytic signal in ultrasonic imaging
[DE84-016843] N85-16598

OBSERVATOIRE DE PARIS-MEUDON (FRANCE).
The abundance of deuterium in the outer solar system from ground-based measurements of monodeuterated methane N85-16725

ODYSSEY RESEARCH ASSOCIATES, INC., ITHACA, N.Y.
Formal verification of mathematical software
[NASA-CR-172407] N85-16489

OESTERREICHISCHES FORSCHUNGSZENTRUM SEIBERSDORF G.M.B.H., VIENNA.
Method for non contacting gauging of the wall thickness of tubes by backscattering radiation
[OEFZS-4274] N85-16144
Immobilization of toxic waste by embedding it in bitumen
[OEFZS-4277] N85-16322
Austrian contributions to fuel rod failure models shown at the International Standard Problem (ISP)-14
[OEFZS-4276] N85-16613
The reactor dynamic code RETRANS: Structure and users guide
[OEFZS-4287] N85-16614
Inquiry into disintegration control of irradiated low enrichment uranium for high temperature gas cooled reactors
[OEFZS-7281] N85-16615

OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, PARIS (FRANCE).
Life prediction at high temperature under multiaxial loading N85-15745
Liquid-fueled Ramjet engines N85-15814

OFFICE OF NAVAL RESEARCH, LONDON (ENGLAND).
Computer science research in Europe
[AD-A146905] N85-16482

OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D.C.
Civilian space stations and the US future in space
[OTA-STI-241] N85-15781
Issues and findings N85-15782
Space infrastructure N85-15783
A buyer's guide to space infrastructure N85-15784
Broadening the debate N85-15785
Toward a goal-oriented civilian space program N85-15786
Results of principal NASA studies on space station uses and functional requirements N85-15787
The evolution of civilian in-space infrastructure, i.e., space station concepts in the United States N85-15788
International involvement in a civilian space station program N85-15789
Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements N85-15790
Title 2: National Commission on Space (Public Law 98-361) N85-15791
Financing considerations and Federal budget impacts N85-15792

OHIO STATE UNIV., COLUMBUS.
Fundamentals of microcrack nucleation mechanics
[NASA-CR-3851] N85-16195
An interactive FORTRAN program for determining reliability of pseudo-range geodetic point positioning using the global positioning system
[AD-A147133] N85-16275
Distributed knowledge base systems for diagnosis and information retrieval
[AD-A146890] N85-16690

OKLAHOMA STATE UNIV., STILLWATER.
A study of the chemical interaction of gases with activated carbon
[AD-A147342] N85-15846

OLD DOMINION UNIV., NORFOLK, VA.
A second-order accurate parabolized Navier-Stokes algorithm for internal flows
[NASA-CR-174258] N85-16059
Ultrasound instrumentation for the 7 inch Mach seven tunnel
[NASA-CR-174277] N85-16586

ONSALA SPACE OBSERVATORY (SWEDEN).
Galactic OH and H2O masers N85-16719

OREGON STATE UNIV., CORVALLIS.
Chemical protection against ionizing radiation
[AD-A147822] N85-16457

OXFORD UNIV. (ENGLAND).
Synthesis and properties of Hexachloromolybdates(5) and related species
[AD-A139599] N85-15852

P

PACIFIC MISSILE TEST CENTER, POINT MUGU, CALIF.
Pulse code modulation telemetry: Properties of various binary modulation types
[AD-A147214] N85-15780

PARIS VI UNIV. (FRANCE).
Laser annealing of ion implanted semiconductors
[AD-A146979] N85-16652

PATTERN ANALYSIS AND RECOGNITION CORP., MCLEAN, VA.
Mental models and cooperative problem solving with expert systems
[AD-A147843] N85-16479

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
The structure of dilute combusting sprays
[NASA-CR-174838] N85-15728
White-light optical information processing and holography
[AD-A146936] N85-16138

PERKIN-ELMER CORP., DANBURY, CONN.
Study of alternate optical and fine guidance sensor designs for the space infrared telescope facility (SIRTF)
[NASA-CR-166614] N85-15794

POLYTECHNIC INST. OF NEW YORK, BROOKLYN.
Basic research in electronic (JSEP): Joint Services Electronics Program
[AD-A147891] N85-16007

POLYTECHNIC OF CENTRAL LONDON (ENGLAND).
Local area network evaluation by MICROSS extensions
[AD-A146773] N85-16521

PRATT AND WHITNEY AIRCRAFT, WEST PALM BEACH, FLA.
Improvement of the corrosion resistance of turbine engine bearings
[AD-A147430] N85-15731

Evaluation of jet fuel deposit kinetics. Lot 4
[AD-A147196] N85-15922

PRATT AND WHITNEY AIRCRAFT GROUP, WEST PALM BEACH, FLA.
View of future requirements for engine cyclic durability by analysis and testing N85-15751

PRINCETON UNIV., N. J.
Rubber-modified epoxies. 1: Cure, transitions, and morphology
[AD-A147377] N85-15908
The problem of climate and climate variation N85-16353

PROFESSIONAL STAFF ASSOCIATION OF THE RANCHO LOS AMIGOS HOSPITAL, INC., DOWNEY, CALIF.
Short-term human respiratory effects of nitrogen dioxide: Determination of quantitative dose-response profiles. Phase 2: Exposure of asthmatic volunteers to 4 PPM NO2
[PB85-104388/GAR] N85-16462

PUERTO RICO UNIV., RIO PIEDRAS.
Optical properties of composite materials
[AD-A146768] N85-15828

PURDUE UNIV., LAFAYETTE, IND.
Variation in spectral response of soybeans with respect to illumination, view, and canopy geometry
[E85-10040] N85-16241
Spectral estimators of absorbed photosynthetically active radiation in corn canopies
[E85-10041] N85-16242
Changes in spectral properties of detached leaves
[E85-10042] N85-16243
Rectification of single and multiple frames of satellite scanner imagery using points and edges as control N85-16263
Metric aspects of digital images and digital image processing
[AD-A147211] N85-16276
Thermophysical property testing using transient techniques
[AD-A147085] N85-16664

R

RAND CORP., SANTA MONICA, CALIF.
Managing recoverable aircraft components in the PPB and related processes: Executive summary
[AD-A146806] N85-16657
Estimating wartime support resource requirements. Statistical and related policy issues
[AD-A147923] N85-16685

RENSSELAER POLYTECHNIC INST., TROY, N. Y.
An autonomous roving vehicle for the planet Mars: A summary of over 15 years of research
[RPI-TR-MP-83] N85-16179
Current and current shear effects in the parabolic approximation for underwater sound channels
[AD-A147833] N85-16597

RESEARCH INST. OF NATIONAL DEFENCE, LINKOEPING (SWEDEN).
Modern signal processing and reconnaissance
[FOA-C-30374-E1] N85-15975
Data handling for the Spectral Radiometer (SPERAD)
[FOA-C-30368-E1,E4] N85-16145

RESEARCH INST. OF NATIONAL DEFENCE, STOCKHOLM (SWEDEN).
NyKINM, a further development of KINM 22
[FOA-C-20559-D8(E3)] N85-15720
Nondestructive deceleration of a rocket sled
[FOA-C-20549-D3] N85-15771
Impressions from a study tour in Finland concerning fiber reinforced plastics, June 1984
[FOA-C-20552-D2(E4,F9)] N85-15831
A metallographic investigation of rotating bands for 7.5 cm artillery projectiles
[FOA-C-20551-D2] N85-15868
Making high explosive bodies for shaped charges by casting or pressing. Shaped charge research at Research Institute of National Defence (FOA) in 1972 - 1983, part 1
[FOA-C-20554-D4-PT-1] N85-15923
Combustion properties of fuel-rich magnesium propellants with HTPB as binder
[FOA-C-20555-D1] N85-15924
Laser ignition of explosives
[FOA-C-20550-D1] N85-16173
Comparison between cycle ergometers with different mechanical braking systems
[FOA-C-54058-H1] N85-16193
Seismicity of southern Sweden
[FOA-C-20543-T1] N85-16340

RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N.C.
Effects of aircraft and flight parameters on energy-efficient profile descents in time-based metered traffic
[NASA-CR-172338-ADD] N85-15706

RICE UNIV., HOUSTON, TEX.
Nonparametric analysis of Minnesota spruce and aspen tree data and LANDSAT data N85-16253

RIJKSUNIVERSITAIR CENTRUM TE ANTWERPEN (BELGIUM).
Operating system versus programming environment, for example the UNIX
[SWA-84/037] N85-16516
Possibilities and impossibilities of microcomputer systems
[AD-1984-904] N85-16522

ROCHESTER UNIV., N. Y.
Theoretical study of laser-induced surface excitations on a grating
[AD-A147855] N85-16172
Optics and opto-electronic systems
[AD-A147277] N85-16630

ROCKWELL INTERNATIONAL CORP., THOUSAND OAKS, CALIF.
Research on electroluminescence in thin film yttrium oxysulfide
[AD-A146909] N85-16582
Aluminum nitride insulator for 3-5 MIS (Metal-Insulator-Semiconductor) applications
[AD-A147842] N85-16662

ROCKWELL INTERNATIONAL SCIENCE CENTER, THOUSAND OAKS, CALIF.
Nonlinear wave propagation study
[AD-A147011] N85-16329

ROLLS-ROYCE LTD., BRISTOL (ENGLAND).
Monitoring engine thermal stresses N85-15735

ROLLS-ROYCE LTD., DERBY (ENGLAND).
Cyclic endurance testing of the RB211-22B cast HP turbine blade N85-15747

ROLLS-ROYCE LTD., LONDON (ENGLAND).
Study of residual stresses introduced into TA6ZrD (685) cylinders by quenching
[BLL-PNR-90240-(8019.3153)] N85-15859

ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, N.Y.
Dual offset reflector antenna systems with rotationally symmetric aperture distributions
[AD-A147346] N85-15961
Efficient computation of reflector antenna aperture distributions and far field patterns
[AD-A147367] N85-15962
A low-sidelobe space feed lens
[AD-A147883] N85-15972
Analytic models for radiation induced loss in optical fibers 2: A physical model
[AD-A147442] N85-16632

RONDOUT ASSOCIATES, INC., STONE RIDGE, N.Y.
Short period guided waves over oceanic and continental paths
[AD-A147053] N85-16331

ROSE ENGINEERING AND RESEARCH, INC., INCLINE VILLAGE, NEV.
Aero-optics experimental techniques
[AD-A146755] N85-16067

ROYAL AIRCRAFT ESTABLISHMENT, BEDFORD (ENGLAND).
Some aspects of engine and airframe integration for Ramjet and Ramrocket powered missiles N85-15812

ROYAL AIRCRAFT ESTABLISHMENT, FARNBOROUGH (ENGLAND).
A discussion of coning errors exhibited by inertial navigation systems
[AD-A147846] N85-15706
The effect of changes in the angle of incidence in the event of a richochet at a float step
[RAE-TRANS-2120] N85-15712
Disc fatigue life predictions for gas turbine engines N85-15743
Calculated parameters for the initial part of an accelerator with high-frequency quadrupole focusing
[RAE-TRANS-2122] N85-16600

ROYAL NETHERLANDS METEOROLOGICAL INST., DE BILT.
The influence of sample collection and methods of analysis on chemical concentrations measured in rainwater
[KNMI-TR-55] N85-15853
Synoptical observations of snow depths at Dutch meteorological stations, 1956 - 1977
[KNMI-TR-51] N85-16407
Wind sheltering correction
[KNMI-TR-52] N85-16408
Comparative investigation of three commercial radiosonde systems
[KNMI-TR-53] N85-16409

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, KJELLER.
Research activities of the Norwegian seismic array (NORSAR)
[AD-A146778] N85-16326
Deployment of a regional array in Norway
[AD-A147032] N85-16330

ROYAL OBSERVATORY, EDINBURGH (SCOTLAND).
Astronomical photography 1984
[ROE-OR-14] N85-16102
Nitrogen flushing during exposure of large Schmidt telescope plates N85-16109
The most effective astronomical photographic emulsions for recording of faint and low-contrast objects N85-16110
The 3a-F emulsion and the quasar redshift cut-off N85-16112
Microspots on spectroscopic plates N85-16113
What do we want: Increased speed, resolution, contrast or DQE? N85-16115
Some aspects of photography with a small Schmidt camera N85-16116
The UK Schmidt telescope and the facilities in Edinburgh N85-16121
The work of the photolabs at the Royal Observatory, Edinburgh N85-16122
Power spectrum analysis of astronomical photographs digitised with small apertures N85-16127
Recent developments on the COSMOS plate-scanning machine N85-16128

RUTGERS - THE STATE UNIV., PISCATAWAY, N. J.
Temperature dependence of the crystal structures of Nylon 11
[AD-A147563] N85-16661

S

SAINT LUKE'S HOSPITAL, MILWAUKEE, WIS.
Safe decompression schedules for caisson workers
[PB85-103612/GAR] N85-16463

SANDERS ASSOCIATES, INC., NASHUA, N. H.
Crystal growth and characterization of BaMgF4
[AD-A146805] N85-16650

SANTA BARBARA RESEARCH CENTER, CALIF.
Thematic Mapper. Volume 1: Calibration report flight model, LANDSAT 5
[E85-10059] N85-16270
Thematic Mapper. Volume 2: Flight model preshipment review
[E85-10060] N85-16271

SAR, INC., RIVERDALE, MD.
Characterizing the scientific potential of satellite sensors
[E85-10044] N85-16244
Characterizing the scientific potential of satellite sensors
[E85-10053] N85-16249

SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEX.
Human factors survey: C-5 pilots
[AD-A147106] N85-16477

SCIENTIFIC RESEARCH ASSOCIATES, INC., GLASTONBURY, CONN.
Development of a Navier-Stokes rotor and stator analysis
[AD-A146967] N85-16070

SELENIA S.P.A., ROME (ITALY).
Rivista Tecnica Selenia, volume 9, number 1 N85-15945
Reference oscillator stability effect on clutter cancellation in a radar system N85-15946
On the generation of random variables for radar simulation purposes N85-15947
Sputtering in thin film technology for optics N85-15948
Equipment for preflight test of an Electronic Countermeasures (ECM) avionic system N85-15949

SERVICIO METEOROLOGICO NACIONAL, BUENOS AIRES (ARGENTINA).
Climate and climate data. Report on the workshop held in Brasilia (Argentina) from 11-15 April 1983 N85-16357

SHANGHAI OBSERVATORY (CHINA).
Comparison of the fine grain compensation hypersensitization (FAH) process with gas hypersensitizing techniques N85-16107
A short note on the high precision navigation of QUASAT N85-15722

SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE), WASHINGTON, D. C.
The Shock and Vibration Digest, volume 16, no. 9
[AD-A146779] N85-16200

SIEMENS A.G., MUNICH (WEST GERMANY).
Development of a 30 GHz/1 kW broadband traveling wave tube with suppression of band edge oscillations
[BMFT-FB-W-84-035] N85-16011
SMITHSONIAN ASTROPHYSICAL OBSERVATORY, CAMBRIDGE, MASS.
The investigation of tethered satellite system dynamics
[NASA-CR-171278] N85-15772
Research relative to the development of a cryogenic microwave cavity gradiometer for orbital use
[NASA-CR-174249] N85-16095
SOCIETE NATIONALE D'ETUDE ET DE CONSTRUCTION DE MOTEURS D'AVIATION, EVRY CEDEX (FRANCE).
Inconel 718 alloy resistance to crack propagation N85-15740
SOCIETE NATIONALE D'ETUDES ET DE CONSTRUCTION DE MOTEURS D'AVIATION, MOISSY-CRAMAYEL (FRANCE).
CFM 56-2. Oligocyclic fatigue of the turbofan disk: Dimensionning and tests for verification and improvements N85-15750
SOFIA UNIV. (BULGARIA).
Processing of photographic observing material at the National Astronomical Observatory Rozhen N85-16120
Some applications of signal-to-noise in photographic stellar photometry N85-16132
SOFTECH, INC., FAIRBORN, OHIO.
Ada compiler validation summary report: New York University (NYU Ada/Ed) compiler, version 1.4 for VAX 11/780, using VMS 3.5
[AD-A146924] N85-16483
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a for Sun 120 Motorola M68010, using 4.2 BSD UNIX-Sun Version 1.1
[AD-A146925] N85-16484
Ada compiler validation summary report: TeleSoft (TeleSoft Ada) compiler, version 2.0a2 for Callen Unistar 300, using System V, version 4.1a
[AD-A147115] N85-16505
SOFTECH, INC., WALTHAM, MASS.
Ada training curriculum. Real-time systems in Ada l401 teacher's guide, volume 1
[AD-A146782] N85-16496
Ada training curriculum. Real-time systems in Ada l401 teacher's guide, volume 2
[AD-A146783] N85-16497
SOUTHERN METHODIST UNIV., DALLAS, TEX.
Exploring the use of structural models to improve remote sensing agricultural estimates N85-16259
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
A crew exposure study. Volume 1: Offshore
[AD-A146884] N85-16449
SPECTRON DEVELOPMENT LABS., INC., COSTA MESA, CALIF.
Aero-optics experimental techniques
[AD-A146755] N85-16067
SRI INTERNATIONAL CORP., MENLO PARK, CALIF.
Image-to-image correspondence: Linear structure matching N85-16266
STANFORD UNIV., CALIF.
Studies in statistical signal processing
[AD-A147130] N85-15959
High Marangoni number convection in a square cavity
[NASA-CR-174283] N85-16078
Laminar flow over a backward-facing step
[AD-A147469] N85-16084
Precise control of flexible manipulators
[NASA-CR-174210] N85-16178
Bootstrap confidence intervals
[AD-A147572] N85-16559
Local likelihood estimation
[AD-A147317] N85-16571
Generalized additive models
[AD-A147454] N85-16573
The evaluation of a deformable diffraction grating for a stigmatic EUV spectroheliometer
[NASA-CR-174248] N85-16621
The development and test of ultra-large-format multi-anode microchannel array detector systems
[NASA-CR-174247] N85-16622
Ion implantation and laser processing of III-V compound semiconductors with applications to the fabrication of microwave devices
[AD-A146846] N85-16651
Spicules and surges
[AD-A146785] N85-16727
STARCK (HERMANN C.) BERLIN, GOSLAR (WEST GERMANY).
Development and production of improved alpha-phase silicon nitride powders for hot pressing and sintering
[BMFT-FB-T-84-208] N85-15890
Development and production of improved silicon carbide powder for pressureless sintering and hot pressing
[BMFT-FB-T-84-211] N85-15917
STATE UNIV. OF NEW YORK, ALBANY.
Synthesis of proterozoic data as a prerequisite for tectonic and thermal modeling
[NASA-CR-174252] N85-16323
STERREWACHT, LEIDEN (NETHERLANDS).
Automated star counts in nebulous areas N85-16137
Cosmology N85-16701
The environment of active galactic nuclei N85-16712
STIRLING POWER SYSTEMS CORP., ANN ARBOR, MICH.
Phase 1-A development kinematic Sterling/Rankine commercial gas-fired heat pump research program
[PB85-100931/GAR] N85-15928
SUSSEX UNIV., BRIGHTON (ENGLAND).
Techniques for nonlinear random vibration problems N85-16201
SYSTEM PLANNING CORP., ARLINGTON, VA.
Speed benefits of tilt-rotor designs for LHX
[NASA-CR-166437] N85-15717

T

TECHNICAL RESEARCH CENTRE OF FINLAND, ESPOO.
Assessment of radiation dosages obtained by intake of radioactive fallout contaminated food
[VTT-292] N85-16460
TECHNISCHE HOCHSCHULE, AACHEN (WEST GERMANY).
Investigations into the improvement of processing of Bolivian tin ores
[BMFT-FB-T-84-184] N85-15807
Measurement and evaluation of the loading of shafts by torsional vibrations N85-16222
TECHNISCHE HOCHSCHULE, VIENNA (AUSTRIA).
Development of a mixed scanning interactive system for decision support
[AD-A146895] N85-16670
TECHNISCHE UNIV., BERLIN (WEST GERMANY).
Concept and cost analysis of an orbiting lunar station
[ILF-MITT-138] N85-15776
TENNESSEE UNIV., KNOXVILLE.
Automatic camera tracking for remote manipulators
[DE85-001897] N85-16187
Far-infrared laser diagnostic on EBT and extreme far-forward laser scattering on ISX
[DE85-001788] N85-16643
TENNESSEE UNIV. SPACE INST., TULLAHOMA.
Contamination and distortion of steady flow field induced by discrete frequency in aircraft gas turbines
[AD-A147092] N85-16073
TEXAS A&M UNIV., COLLEGE STATION.
Catalytic oxidation by transition metal ions in zeolites
[AD-A146828] N85-15842
Proceedings of the Second Annual Symposium on Mathematical Pattern Recognition and Image Analysis Program
[E85-10056] N85-16251
Multivariate spline methods in surface fitting N85-16257
Autoregressive spectral estimation for two dimensional time series N85-16258
Lunar nuclear power feasibility study
[NASA-CR-171831] N85-16611
TEXAS CHRISTIAN UNIV., FORT WORTH.
New synthesis of phosphazene polymers
[AD-A147567] N85-15910
TEXAS UNIV., AUSTIN.
Titanium Matrix/Continuous Fiber/Continuous fiber composite interface interactions and their influence on mechanical properties
[AD-A147504] N85-15829
Properties of miscible polymer blends
[AD-A147090] N85-15903
Electronics research at the University of Texas at Austin
[AD-A146900] N85-15998
Spatial estimation from remotely sensed data via empirical Bayes models N85-16256
TEXAS UNIV. AT DALLAS, RICHARDSON.
Research relative to plasma transport across the magnetopause
[NASA-CR-174300] N85-16636
TEXTRON BELL AEROSPACE CO., BUFFALO, N. Y.
Study of high performance alloy electroforming
[NASA-CR-174276] N85-15875
TOKYO ASTRONOMICAL OBSERVATORY (JAPAN).
Extending magnitude standards to faint stars with a sub-beam prism N85-16124
Sub-beam prism used at the Bosscha Schmidt telescope N85-16125
TORONTO UNIV. (ONTARIO).
Numerical reconstruction of part of an actual blast-wave flow field to agree with available experimental data
[UTIAS-TN-251] N85-16061
TUFTS UNIV., MEDFORD, MASS.
The symmetry group and exponents of operator stable probability measures
[AD-A147187] N85-16568
TURBOMECA S. A. - BREVETS SZYDLOWSKI, BORDES (FRANCE).
Design and test requirements for development of today's engines N85-15737
TUSKEGEE INST., ALA.
An improved computer model for prediction of axial gas turbine performance losses
[NASA-CR-174246] N85-15724

U

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, CULHAM (ENGLAND).
Silent discharge carbon dioxide gas laser machining facility
[BLL-CTO-2267-(9091.9F)] N85-16150
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, DOUNREAY (SCOTLAND).
Comparison measurements on optical particle counters
[BLL-DOUNREAY-TR-934-(9091.9F)] N85-16092
Theoretical and experimental study of hydro-elastic instability on the line of shafting of a rotating machine
[BLL-DOUNREAY-TR-937-(9091.9F)] N85-16174
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL (ENGLAND).
A narrow band pulsed eddy current instrument for materials testing
[AERE-R-11229] N85-16149
Quantitative acoustic emission techniques
[AERE-R-11262] N85-16203
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, RISLEY (ENGLAND).
Corrosion study on zirconium refractory coatings. 1: Oxidation of zirconium nitride coatings by oxygen
[BLL-RISLEY-TR-5044-(9091.9F)] N85-15857
Deposition of titanium nitride coatings by reactive evaporation and electrically activated reactive evaporation
[BLL-TRANS-5043-(9091.9F)] N85-15858
Austenitic stainless steel for high temperature and pressure applications
[BLL-RISLEY-TR-4527-(9091.9F)] N85-15860
Testing of non-alloyed and low-alloyed steels for their behaviour with respect to intercrystalline stress corrosion cracking
[BLL-RISLEY-TR-4546-(9091-9F)] N85-15861
Risks in the transport and storage of liquefied natural gas. Sub-project 5-2: Investigation into building damage
[BLL-RISLEY-TR-4608-(9091.9F)] N85-15926
Acoustic transducers for fast reactor instrumentation
[BLL-RISLEY-TR-4979-(9091.9F)] N85-16091
Comparison of the sensitivities of ultrasonic, radiographic and acoustic emission test methods for the examination of a thick weld
[BLL-RISLEY-TR-4547-(9091.9F)] N85-16194
Nondestructive tests and fracture mechanics investigations in the Component Integrity Research Programme
[BLL-RISLEY-TR-4541-(9091.9F)] N85-16199
Ultrasonic measurements, X-ray photographs and image processing
[BLL-RISLEY-TR-4586-(9091.9F)] N85-16583
UNITED TECHNOLOGIES CORP., SAN JOSE, CALIF.
Integral boost, heat protection, port covers and transition N85-15813
Special problems of Ramjet with solid fuel N85-15815
UNITED TECHNOLOGIES CORP., WINDSOR LOCKS, CONN.
Development of a preprototype times wastewater recovery subsystem, addendum
[NASA-CR-171823] N85-16468
UNITED TECHNOLOGIES RESEARCH CENTER, EAST HARTFORD, CONN.
Imide modified epoxy matrix resins
[NASA-CR-174695] N85-15892
UNIVERSITY OF NORTHERN ILLINOIS, DE KALB.
Sequential and parallel matrix computations
[AD-A147871] N85-16562
UNIVERSITY OF SOUTH FLORIDA, TAMPA.
Conference on Singlet Molecular Oxygen (COSMO 84), program and abstracts
[AD-A147281] N85-16605
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.
Upgrading flexible infrared waveguides
[AD-A146763] N85-16160

UTAH UNIV., SALT LAKE CITY.
Detecting agricultural to urban land use change from multi-temporal MSS digital data
[E85-10049] N85-16245
An integrated remote sensing approach for identifying ecological range sites
[E85-10050] N85-16246

V

VANDERBILT UNIV., NASHVILLE, TENN.
The relationship between radiation sensitivity and redox equilibria
[AD-A147216] N85-15906
VERMONT UNIV., BURLINGTON.
(Vinyloxy)fluorocyclotriphosphazenes
[AD-A147448] N85-15850
VIRGINIA POLYTECHNIC INST. AND STATE UNIV., BLACKSBURG.
A study of the stress wave factor technique for the characterization of composite materials
[NASA-CR-174219] N85-15821
Stresses in pin-loaded orthotropic plates using photoelasticity
[NASA-CR-172498] N85-16204
VIRGINIA UNIV., CHARLOTTESVILLE.
Astrometric applications of the Mt. Stromlo PDS 1010A N85-16136
Omni transforms: Applications to renewal theory
[AD-A146939] N85-16534

W

WASHINGTON STATE UNIV., PULLMAN.
Measurement of soft X-ray absorption spectra with a fluorescent ion chamber detector
[AD-A142213] N85-15838
WASHINGTON UNIV., SEATTLE.
Multiple scattering effects on transmission through the atmosphere
[AD-A147527] N85-15969
Conditionally heteroscedastic autoregressions
[AD-A147168] N85-16567
WASHINGTON UNIV., ST. LOUIS, MO.
Electron distribution function and mobility in 3-5 compounds for high and low fields
[AD-A147447] N85-16658
Transport properties and distribution functions in 3-5 semiconductors
[AD-A147525] N85-16660
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
Gas cooled fuel cell systems technology development
[NASA-CR-174732] N85-16291
WESTINGHOUSE RESEARCH AND DEVELOPMENT CENTER, PITTSBURGH, PA.
Superconducting rotor dynamics
[AD-A147176] N85-16000
WESTLAND AIRCRAFT LTD., YEOVIL (ENGLAND).
Helicopter data acquisition in WHL N85-15676
WISCONSIN UNIV., MADISON.
Photoluminescent and electroluminescent properties of Cd sub 0.95 Mn sub 0.05 Se electrodes
[AD-A146775] N85-15995
An asymptotic analysis of a transient p-n junction model
[AD-A147270] N85-16004
On the asymptotic analysis of travelling shocks and phase boundaries in elastic bars
[AD-A147239] N85-16076
Existence of slow steady flows of viscoelastic fluids with differential constitutive equations
[AD-A147240] N85-16077
The resistance and mobility functions of two equal spheres in low Reynolds number flow
[AD-A147301] N85-16080
Stability of rigid motions and rollers in bicomponent flows of immiscible liquids
[AD-A147302] N85-16081
Sedimentation of two arbitrarily oriented spheroids in a viscous fluid
[AD-A147303] N85-16082
Controlled ecological life support system higher plant flight experiments
[NASA-CR-177323] N85-16471
Stable monotone variational inequalities
[AD-A147123] N85-16544
The theory of optimal confidence limits for systems reliability with counterexamples for results on optimal confidence limits for series systems
[AD-A147236] N85-16546
A dual quadratic programming algorithm
[AD-A147237] N85-16547
Self similar solutions for a degenerate Cauchy problem
[AD-A147241] N85-16548
Asymptotic behaviour of the plasma equation
[AD-A147242] N85-16549
A counterexample to a result of Strang and Fix concerning controlled approximation
[AD-A147360] N85-16550
The stable evaluation of multivariate b-splines
[AD-A147386] N85-16551
Some applications of penalty functions in mathematical programming
[AD-A147443] N85-16552
Viscosity solutions of Hamilton-Jacobi equations at the boundary
[AD-A147444] N85-16553
Splitting methods for the numerical solution of the incompressible Navier-Stokes equations
[AD-A147463] N85-16554
An iterative scheme for linear complementarity problems
[AD-A147464] N85-16555
Model robust response surface designs: Scaling 2-level factorials
[AD-A147494] N85-16556
Nonlinear semigroups and evolution governed by accretive operators
[AD-A147556] N85-16557
On existence and uniqueness of solutions of Hamilton-Jacobi equations
[AD-A147597] N85-16560
Response surface designs
[AD-A147202] N85-16569
A factor analysis for time series
[AD-A147495] N85-16574
Belief structures
[AD-A147526] N85-16575
Infrared emission and atomic transitions
[AD-A147840] N85-16607
WISCONSIN UNIV., MILWAUKEE.
Lattice statistics
[AD-A146862] N85-16530
WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.
A compilation of moored current meter and wind recorder data. Volume 35: Long-Term Upper Ocean Study (LOTUS) (Moorings 764, 765, 766, 767, 770), May 1982 - April 1983
[AD-A147103] N85-16412
The long term upper ocean study (LOTUS). Cruise summary and hydrographic data report, OCEANUS 154, May 1984
[AD-A147908] N85-16414
WORLD METEOROLOGICAL ORGANIZATION, GENEVA (SWITZERLAND).
Climate Conference for Latin America and the Caribbean
[WMO-632] N85-16352
Review of climate problems in Latin America and the Caribbean N85-16354
Crop yield forecasting N85-16360
The effects of long-periodic forcing in a zero-dimensional climate model N85-16363
Index cycles simulated by a low order forced barotropic model N85-16364
Climatological information and water resources N85-16367
Water and climate, study of one case N85-16369
Socio-economic impact of climate N85-16372
A microprocessor data system for developing countries N85-16377
The El Nino phenomenon and its agrometeorological implications N85-16382
WYLE LABS., INC., HUNTSVILLE, ALA.
Commerce Laboratory: Mission analysis payload integration study
[NASA-CR-171298] N85-15764

X

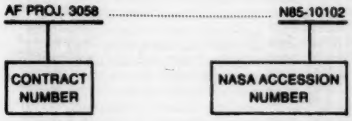
XEROX PALO ALTO RESEARCH CENTER, CALIF.
Preparation and evaluation of ZnSe and ZnS sub X Se sub 1-x epitaxial layers on Ge substrates for applications in surface passivation and heterojunction devices
[AD-A147432] N85-16657

Z

ZYCOR, INC., AUSTIN, TEX.
Manual and automated line generalization and feature displacement: Appendixes
[AD-A143251] N85-16689

CONTRACT NUMBER INDEX

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number the NASA accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order. The NASA accession number denotes the number by which the citation is identified.

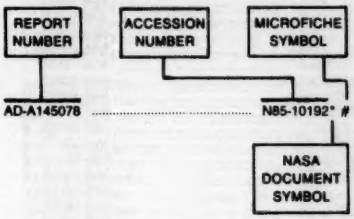
AF PROJ. 1123 ..... N85-16466
AF PROJ. 2301 ..... N85-15852
N85-16640
AF PROJ. 2302 ..... N85-16333
AF PROJ. 2303 ..... N85-16333
AF PROJ. 2305 ..... N85-15962
AF PROJ. 2306 ..... N85-16632
AF PROJ. 2308 ..... N85-15849
AF PROJ. 2309 ..... N85-16330
N85-16331
AF PROJ. 2310 ..... N85-16641
AF PROJ. 4600 ..... N85-15972
AF PROJ. 5797 ..... N85-16612
AF PROJ. 6670 ..... N85-16403
AF PROJ. 6893 ..... N85-16453
AF PROJ. 7184 ..... N85-16182
N85-16453
AF PROJ. 8809 ..... N85-15997
AF PROJ. 9991 ..... N85-16894
AF-AFOSR-ISSA-83-00008 ..... N85-15843
AF-AFOSR-0008-82 ..... N85-16539
AF-AFOSR-0030-82 ..... N85-16579
AF-AFOSR-0049-83 ..... N85-16073
AF-AFOSR-0052-80 ..... N85-15829
AF-AFOSR-0064-81 ..... N85-15852
AF-AFOSR-0086-81 ..... N85-16212
AF-AFOSR-0116-81 ..... N85-16533
AF-AFOSR-0122-81 ..... N85-16545
AF-AFOSR-0140-83 ..... N85-16138
AF-AFOSR-0143-83 ..... N85-16075
AF-AFOSR-0148-83 ..... N85-16464
AF-AFOSR-0167-82 ..... N85-16528
AF-AFOSR-0170-80 ..... N85-16542
AF-AFOSR-0185-81 ..... N85-15820
AF-AFOSR-0192-81 ..... N85-16530
AF-AFOSR-0195-80 ..... N85-16506
AF-AFOSR-0223-81 ..... N85-15999
AF-AFOSR-0228-83 ..... N85-15959
AF-AFOSR-0229-83 ..... N85-16579
AF-AFOSR-0255-82 ..... N85-16690
AF-AFOSR-0312-83 ..... N85-16607
AF-AFOSR-0318-83 ..... N85-15753
AF-AFOSR-0329-83 ..... N85-15703
AF-AFOSR-0334-83 ..... N85-16562
ARPA ORDER 4016 ..... N85-15964
ARPA ORDER 4174 ..... N85-16655
ARPA ORDER 4493 ..... N85-16331
ARPA ORDER 4941 ..... N85-15913
ARPA ORDER 4950 ..... N85-16330
DA PROJ. RR0-1102 ..... N85-15840
DA PROJ. YR0-2303 ..... N85-16492
N85-16532
DA PROJ. 1L1-61101-A-91-A N85-16140
DA PROJ. 1L1-61101-AH-43 ..... N85-16216
DA PROJ. 1L1-61102-AH-43 ..... N85-16507
DA PROJ. 1L1-62701-AH-92 ..... N85-16625
DA PROJ. 1L7-62733-AH-20 ..... N85-16184
DA PROJ. 1T1-61102-BH-57 ..... N85-16411
N85-16652
DA PROJ. 2Q2-62717-A-765 ..... N85-16475
DA PROJ. 2Q2-62731-A-792 ..... N85-16475
DA PROJ. 2Q2-63743-A-794 ..... N85-16476
N85-16680
DA PROJ. 3E1-62777-A-879 ..... N85-16447
N85-16448
DA PROJ. 3M1-62734-A-875 ..... N85-16423
DA PROJ. 3S4-64717-D-832 ..... N85-16456
DA PROJ. 4A1-61102-AT-24 ..... N85-16400
DA PROJ. 4A1-62731-AT-41 ..... N85-16683
DA PROJ. 230-5 ..... N85-15961
DA PROJ. 7670 ..... N85-16332
DA-ERO-78-G110 ..... N85-16521
DAAB07-82-C-J071 ..... N85-16625
DAAB07-82-K-J196 ..... N85-16495
DAAB07-83-C-K514 ..... N85-16496
N85-16497
DAAG29-79-G-0040 ..... N85-15996
DAAG29-80-C-0041 ..... N85-16004
N85-16076
N85-16077
N85-16080
N85-16081
N85-16082
N85-16544
N85-16546
N85-16547
N85-16548
N85-16549
N85-16550
N85-16551
N85-16552
N85-16553
N85-16554
N85-16555
N85-16556
N85-16557
N85-16560
N85-16569
N85-16574
N85-16575
DAAG29-81-C-0008 ..... N85-16623
DAAG29-81-D-0100 ..... N85-15730
DAAG29-81-G-0015 ..... N85-15828
DAAG29-81-K-0024 ..... N85-15953
DAAG29-81-K-0061 ..... N85-16651
DAAG29-81-K-0063 ..... N85-16276
DAAG29-81-K-0095 ..... N85-15910
DAAG29-81-K-0096 ..... N85-15842
DAAG29-81-K-0098 ..... N85-15846
DAAG29-81-K-0108 ..... N85-16538
N85-16540
DAAG29-81-K-0118 ..... N85-15906
DAAG29-81-K-0134 ..... N85-16630
DAAG29-81-K-0147 ..... N85-15903
DAAG29-82-K-0001 ..... N85-16217
DAAG29-82-K-0037 ..... N85-16215
DAAG29-82-K-0051 ..... N85-16081
DAAG29-82-K-0056 ..... N85-16559
DAAG29-82-K-0084 ..... N85-16005
DAAG29-82-K-0168 ..... N85-16527
N85-16529
DAAG29-83-K-0019 ..... N85-15996
DAAG29-84-K-0005 ..... N85-16526
DAAG29-84-M-0292 ..... N85-15841
DAAH01-82-D-A008 ..... N85-16692
DAAH01-82-D-A013 ..... N85-16171
DAAK70-82-C-0149 ..... N85-16689
DACA89-79-C-0010 ..... N85-16279
DACW39-81-C-0069 ..... N85-16543
DAJA37-81-C-0587 ..... N85-16652
DAJA37-82-C-0060 ..... N85-16654
DAJA45-83-C-0034 ..... N85-16411
DAMD17-83-C-3006 ..... N85-16456
DARPA ORDER 4400 ..... N85-16329
DE-AC03-76SF-00515 ..... N85-16559
DE-AC04-76DP-00789 ..... N85-16488
DE-AC05-84OR-21400 ..... N85-15885
N85-15916
N85-16187
N85-16406
N85-16608
N85-16609
N85-16610
N85-16643
N85-16644
DE-AC05-84OS-21400 ..... N85-16197
N85-16598
DE-AC09-76SR-00001 ..... N85-16189
DE-AI01-78ET-20320 ..... N85-16299
DE-AI01-78ET-20356 ..... N85-16295
N85-16296
N85-16297
DE-AI01-77ET-13111 ..... N85-16300
DE-AI01-78CS-54209 ..... N85-15992
DE-AI01-80CS-5019 ..... N85-16696
DE-AI01-80CS-50194 ..... N85-15895
N85-16699
DE-AI01-80ET-17088 ..... N85-16291
DE-AI08-79DP-40092 ..... N85-16638
DE-AM04-80AL-13137 ..... N85-16298
DE-AT03-ER-10843 ..... N85-16559
DE-AT03-84ER-13164 ..... N85-16088
DEN3-215 ..... N85-16300
DEN3-339 ..... N85-16696
DEN3-342 ..... N85-16699
DEN3-390 ..... N85-16291
DFG-GE-209/10 ..... N85-16133
DFG-VE-37/13 ..... N85-16135
DOT-FA79NA-6083 ..... N85-15919
DTCG23-80-C-20015 ..... N85-16449
DTFA01-82-Y-30562 ..... N85-15707
DTFA03-83-C-00036 ..... N85-15920
EMW-E-0883 ..... N85-16457
FY8952-82-60024 ..... N85-15760
F59-553 ..... N85-16281
F61-542 ..... N85-15881
F04701-83-C-0084 ..... N85-15952
N85-15966
N85-16167
N85-16339
N85-16405
F19628-80-C-0002 ..... N85-15769
N85-16656
F19628-80-C-0213 ..... N85-15964
F19628-81-C-0188 ..... N85-16334
F19628-81-K-0007 ..... N85-16336
F19628-82-C-0033 ..... N85-16657
F19628-83-K-0031 ..... N85-16260
F29601-82-C-0013 ..... N85-16067
F29601-82-C-0059 ..... N85-16160
F29601-82-K-0068 ..... N85-15848
F30602-82-C-0059 ..... N85-16498
F30602-83-C-0040 ..... N85-16494
F33600-84-D-0260 ..... N85-16483
N85-16484
N85-16505
F33615-79-C-2026 ..... N85-16000
F33615-80-C-0512 ..... N85-16425
F33615-81-C-2023 ..... N85-15731
F33615-81-C-3201 ..... N85-16213
F33615-81-K-1539 ..... N85-16488
F33615-82-C-0501 ..... N85-16503
F33615-82-C-5102 ..... N85-15882
F33615-83-C-1040 ..... N85-15722
F49620-80-C-0004 ..... N85-16500
N85-16504
F49620-81-C-0069 ..... N85-16582
F49620-81-K-0011 ..... N85-16664
F49620-82-C-0009 ..... N85-16537
N85-16563
N85-16568
N85-16577
N85-16578
N85-16580
N85-16581
F49620-82-C-0018 ..... N85-16685
F49620-82-C-0033 ..... N85-15998
F49620-82-C-0034 ..... N85-16662
F49620-82-C-0055 ..... N85-16069
N85-16087
F49620-82-C-0084 ..... N85-16007
F49620-82-K-0002 ..... N85-16074
F49620-83-C-0017 ..... N85-16331
F49620-83-C-0065 ..... N85-16329
F49620-83-C-0119 ..... N85-16070
F49620-83-C-0134 ..... N85-16634
F49620-84-C-0013 ..... N85-16330

JPL PROJ. 5030-471 ..... N85-15992
JPL PROJ. 5101-251 ..... N85-16296
JPL PROJ. 5105-142 ..... N85-16298
JPL PROJ. 5220-30 ..... N85-16297
JPL PROJ. 5230-13 ..... N85-16295
JPL-956230 ..... N85-16136
JPL-956508 ..... N85-16302
MDA903-79-C-0191 ..... N85-16475
N85-16476
MDA903-81-C-0166 ..... N85-16668
N85-16669
MDA903-81-C-0196 ..... N85-16680
MDA903-81-C-0381 ..... N85-16667
MDA903-82-C-0348 ..... N85-16659
MDA903-82-G-0053 ..... N85-16681
MDA903-82-G-0055 ..... N85-16675
MDA903-83-C-0027 ..... N85-16266
MIPR-ARO-115-84 ..... N85-16327
M09-93 ..... N85-16452
NAGW-95 ..... N85-16245
N85-16246
NAGW-489 ..... N85-16323
NAGW-540 ..... N85-16621
NAGW-551 ..... N85-16622
NAG1-229 ..... N85-16060
NAG1-322 ..... N85-16178
NAG1-423 ..... N85-16059
NAG2-171 ..... N85-16849
NAG3-190 ..... N85-15728
NAG3-260 ..... N85-15877
NAG3-262 ..... N85-16293
NAG3-340 ..... N85-16195
NAG5-338 ..... N85-16095
NAG5-366 ..... N85-16636
NASA ORDER C-72801-D N85-15916
NASA ORDER C-74148-D N85-15916
NASA ORDER H-34328-B N85-15766
NASW-3541 ..... N85-15988
N85-16206
N85-16421
N85-16422
N85-16648
NASW-3542 ..... N85-15805
N85-15826
N85-15898
N85-15942
N85-16160
NASW-4004 ..... N85-15835
N85-15836
N85-15876
N85-15879
N85-16207
N85-16301
NASW-4005 ..... N85-15834
N85-15837
N85-16637
N85-16697
NASW-4006 ..... N85-15684
N85-15765
NAS1-16133 ..... N85-15994
NAS1-16273 ..... N85-15718
NAS1-16669 ..... N85-15993
NAS1-16758 ..... N85-15685
NAS1-16883 ..... N85-16098
NAS1-16978 ..... N85-16588
NAS1-17003 ..... N85-16590
NAS1-17023 ..... N85-15706
NAS1-17070 ..... N85-16063
N85-16064
N85-16480
N85-16525
NAS1-17099 ..... N85-16586
NAS1-17130 ..... N85-16480
N85-16525
NAS1-17526 ..... N85-15714
NAS1-17572 ..... N85-15686
NAS1-17579 ..... N85-16489
NAS2-10989 ..... N85-16470
NAS2-11020 ..... N85-15717
NAS2-11261 ..... N85-15715
NAS2-11549 ..... N85-15793
NAS2-11550 ..... N85-15795
NAS2-11551 ..... N85-15794
NAS2-11555 ..... N85-16490
NAS3-21287 ..... N85-16292
NAS3-21943 ..... N85-15806
NAS3-22253 ..... N85-15804
NAS3-22498 ..... N85-15944
NAS3-23526 ..... N85-15892
NAS5-83 ..... N85-16269
NAS5-24200 ..... N85-16270
N85-16271
NAS5-26414 ..... N85-16272
NAS5-26962 ..... N85-15774
NAS5-27139 ..... N85-16159
NAS5-27297 ..... N85-16376
NAS5-27346 ..... N85-16268
NAS5-28200 ..... N85-16244
NAS7-918 ..... N85-15701
N85-15798
N85-15819
N85-15989
N85-15990
N85-15991
N85-16294
N85-16297
N85-16298
N85-16491
NAS8-32219 ..... N85-15880
NAS8-32812 ..... N85-15759
NAS8-32998 ..... N85-15824
N85-15825
NAS8-33881 ..... N85-16078
NAS8-34978 ..... N85-16181
N85-16208
NAS8-35189 ..... N85-16325
NAS8-35817 ..... N85-15875
NAS8-36109 ..... N85-15764
NAS8-36160 ..... N85-15772
NAS9-13873 ..... N85-15827
NAS9-15471 ..... N85-16468
NAS9-15800 ..... N85-15777
N85-16260
NAS9-16256 ..... N85-15801
N85-15802
N85-15803
NAS9-16528 ..... N85-16241
N85-16242
N85-16243
NAS9-16664 ..... N85-16251
N85-16262
N85-16263
N85-16266
NAS9-17141 ..... N85-16611
NB79-SBCA-0086 ..... N85-16518
NCC2-67 ..... N85-16472
NCC2-136 ..... N85-16471
NCC2-210 ..... N85-16469
NCC2-231 ..... N85-16473
NCC2-234 ..... N85-16250
NCC3-30 ..... N85-15895
NCC3-38 ..... N85-15943
NFS MCS-81-15475 ..... N85-16538
NR PROJ. 051-690 ..... N85-15995
NR PROJ. 056-749 ..... N85-16172
NR PROJ. 356-663 ..... N85-15850
NR PROJ. 359-653 ..... N85-15995
NSF AST-82-00232 ..... N85-16136
NSF AST-82-03926 ..... N85-16104
NSF BSR-81-15316 ..... N85-16406
NSF CEE--09252 ..... N85-16279
NSF DDP-82-07098 ..... N85-16288
NSF DMS-83-15316 ..... N85-16531
NSF DMS-84-05179 ..... N85-16544
NSF MCS-81-06814 ..... N85-16086
NSF MCS-82-00632 ..... N85-16552
N85-16555
NSF MCS-82-10950 ..... N85-16076
N85-16077
N85-16081
N85-16550
N85-16556
NSF MCS-82-15064 ..... N85-16081
NSG-1621 ..... N85-16204
NSG-1629 ..... N85-15690
NSG-3172 ..... N85-15821
NSG-3295 ..... N85-15724
NSG-5074 ..... N85-16101
N00014-75-C-0218 ..... N85-16591
N00014-75-C-0673 ..... N85-16727
N00014-75-C-0693 ..... N85-15844
N00014-75-C-0955 ..... N85-15900
N00014-76-C-0013 ..... N85-16492
N00014-76-C-0197 ..... N85-16412
N00014-76-C-0288 ..... N85-16597
N00014-76-C-1105 ..... N85-15960
N85-15963
N00014-77-C-0002 ..... N85-15915
N00014-77-C-0018 ..... N85-15847
N00014-77-C-0387 ..... N85-15995
N00014-77-C-0532 ..... N85-16674
N00014-77-C-0553 ..... N85-16602
N00014-77-C-0605 ..... N85-15850
N00014-77-C-0623 ..... N85-16531
N85-16535
N00014-78-C-0633 ..... N85-15995
N00014-78-C-0723 ..... N85-15989
N00014-79-C-0321 ..... N85-16546
N00014-79-C-0661 ..... N85-16486
N00014-79-C-0839 ..... N85-16006
N00014-80-C-0021 ..... N85-16584
N00014-80-C-0048 ..... N85-16085
N85-16086
N00014-80-C-0147 ..... N85-15840
N00014-80-C-0321 ..... N85-16566
N00014-80-C-0322 ..... N85-16566
N00014-80-C-0472 ..... N85-16172
N00014-80-C-0505 ..... N85-16458
N85-16513
N85-16515
N85-16526
N00014-80-C-0532 ..... N85-15902
N00014-80-C-0542 ..... N85-16670
N00014-80-C-0557 ..... N85-15907
N00014-80-C-0622 ..... N85-16515
N00014-80-C-0795 ..... N85-16661
N00014-80-C-0957 ..... N85-16168
N00014-81-C-0265 ..... N85-16655
N00014-81-C-0456 ..... N85-16499
N00014-81-C-2376 ..... N85-16169
N00014-81-K-0340 ..... N85-16559
N00014-82-C-0404 ..... N85-16413
N00014-82-K-0062 ..... N85-16567
N00014-82-K-0322 ..... N85-15899
N00014-82-K-0324 ..... N85-16068
N00014-82-K-0335 ..... N85-16078
N85-16084
N00014-82-K-0496 ..... N85-16211
N00014-82-K-0530 ..... N85-15838
N00014-82-K-0631 ..... N85-16631
N00014-82-K-0692 ..... N85-16658
N85-16660
N00014-83-AF-00001 ..... N85-16445
N00014-83-C-0061 ..... N85-16650
N00014-83-C-0170 ..... N85-16170
N00014-83-C-0457 ..... N85-16561
N00014-83-C-0537 ..... N85-16479
N00014-83-C-0574 ..... N85-16511
N00014-83-C-0744 ..... N85-16161
N00014-83-C-2183 ..... N85-16626
N00014-83-C-2316 ..... N85-15951
N00014-83-K-0093 ..... N85-16501
N00014-83-K-0107 ..... N85-16214
N00014-83-K-0136 ..... N85-16083
N00014-83-K-0193 ..... N85-16474
N00014-83-K-0472 ..... N85-16559
N85-16571
N85-16573
N00014-83-K-0624 ..... N85-16534
N00014-83-K-0695 ..... N85-16603
N00014-83-K-2024 ..... N85-16842
N00014-84-C-0018 ..... N85-16572
N00014-84-C-0032 ..... N85-16605
N00014-84-C-0134 ..... N85-16412
N85-16414
N00014-84-C-0193 ..... N85-16592
N00014-84-C-0304 ..... N85-15767
N00014-84-C-0676 ..... N85-15968
N00014-84-C-0697 ..... N85-15913
N00014-84-C-0699 ..... N85-15914
N00014-84-K-0021 ..... N85-15908
N00014-84-K-0049 ..... N85-16541
N00014-84-K-0073 ..... N85-16633
N00140-80-C-0097 ..... N85-15922
N00167-81-R-0278 ..... N85-15851
N62269-82-C-0284 ..... N85-15881
N62583-82-M-T122 ..... N85-16209
N62583-83-M-T265 ..... N85-16492
N85-16532
PHS-OH-00947 ..... N85-16463
RR0-0010 ..... N85-16570
RR0-1102 ..... N85-15847
RR0-1107 ..... N85-16161
N85-16631
RR0-1108 ..... N85-16592
RR0-2102 ..... N85-16658
RR0-3302 ..... N85-16335
RR0-3303 ..... N85-16383
RR0-3406 ..... N85-15965
RR0-4108 ..... N85-16446
RR0-4209 ..... N85-16511
W-7405-ENG-26 ..... N85-15916
N85-16187
W-7405-ENG-48 ..... N85-16188
W06-04 ..... N85-15780
W15-494 ..... N85-16335
YR0-23003 ..... N85-16209
99-53-02 ..... N85-16490
055-99-12 ..... N85-16298
179-80-70 ..... N85-15766
199-22-76-02 ..... N85-16728
199-60-42 ..... N85-16471
199-60-62 ..... N85-16469
N85-16472
199-61-12 ..... N85-16470
N85-16473
324-01-00-01 ..... N85-15686
N85-16489

423-30-01	N85-15793
	N85-15794
	N85-15795
	N85-16724
505-31-3A	N85-15689
505-31-03-01	N85-15694
505-31-09	N85-16098
505-31-21	N85-15687
505-31-23-07	N85-15695
505-31-33-12	N85-16587
505-31-42	N85-15728
	N85-16663
505-31-53-10	N85-15755
505-31-83	N85-16525
	N85-16565
505-31-83-01	N85-16480
505-32-6A	N85-15658
505-32-32	N85-15726
505-33-1B	N85-15897
505-33-5B	N85-15822
505-33-7A	N85-15823
505-33-7C	N85-16205
505-33-43-07	N85-15691
505-33-43-09	N85-15696
505-33-53	N85-15697
505-34-13-34	N85-16343
505-40-1B	N85-16100
505-40-22	N85-15727
505-40-74	N85-15688
	N85-15725
	N85-15758
505-42-11	N85-15715
505-42-94	N85-16099
505-43-11	N85-15752
505-43-23	N85-15685
505-43-43-01	N85-15657
	N85-16062
505-45-43	N85-15692
505-45-45	N85-15702
505-53-1A	N85-16195
506-51-13	N85-15778
	N85-16065
506-53-1B	N85-15893
506-53-43-01	N85-15796
506-53-53	N85-16066
506-55-82A	N85-15804
506-58-22	N85-15779
532-01-11	N85-15693
533-02-21	N85-15729
533-04-1A	N85-16096
535-03-11	N85-15716
776-33-41	N85-16299
776-33-41-50	N85-16588
776-52-62	N85-16297
778-36-05	N85-15992
779-00-00	N85-15819

REPORT / ACCESSION NUMBER INDEX

Typical Report / Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The NASA accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

A-9127 ..... N85-15716* #
A-9671 ..... N85-15693* #

AAAF-NT-79-08 ..... N85-15684* #

AD-A139599 ..... N85-15852 #
AD-A142176 ..... N85-16464 #
AD-A142213 ..... N85-15838 #
AD-A142547 ..... N85-16474 #
AD-A143251 ..... N85-16689 #
AD-A146723 ..... N85-16443 #
AD-A146726 ..... N85-15950 #
AD-A146727 ..... N85-16492 #
AD-A146729 ..... N85-16411 #
AD-A146730 ..... N85-16493 #
AD-A146737 ..... N85-16494 #
AD-A146739 ..... N85-15698 #
AD-A146741 ..... N85-16526 #
AD-A146753 ..... N85-15840 #
AD-A146754 ..... N85-16444 #
AD-A146755 ..... N85-16067 #
AD-A146756 ..... N85-16666 #
AD-A146759 ..... N85-16495 #
AD-A146763 ..... N85-16160 #
AD-A146768 ..... N85-15828 #
AD-A146771 ..... N85-15951 #
AD-A146772 ..... N85-16068 #
AD-A146773 ..... N85-16521 #
AD-A146775 ..... N85-15995 #
AD-A146778 ..... N85-16326 #
AD-A146779 ..... N85-16200 #
AD-A146780 ..... N85-16363 #
AD-A146782 ..... N85-16496 #
AD-A146783 ..... N85-16497 #
AD-A146785 ..... N85-16727 #
AD-A146786 ..... N85-16481 #
AD-A146791 ..... N85-15899 #
AD-A146793 ..... N85-16445 #
AD-A146794 ..... N85-16446 #
AD-A146796 ..... N85-16209 #
AD-A146804 ..... N85-16327 #
AD-A146805 ..... N85-16650 #
AD-A146806 ..... N85-16667 #
AD-A146808 ..... N85-16447 #
AD-A146809 ..... N85-16527 #
AD-A146810 ..... N85-16581 #
AD-A146811 ..... N85-15699 #
AD-A146816 ..... N85-16182 #
AD-A146817 ..... N85-15841 #
AD-A146818 ..... N85-16448 #
AD-A146825 ..... N85-15952 #
AD-A146827 ..... N85-16823 #
AD-A146828 ..... N85-15842 #
AD-A146831 ..... N85-16812 #
AD-A146832 ..... N85-16475 #
AD-A146836 ..... N85-15900 #
AD-A146837 ..... N85-16528 #
AD-A146844 ..... N85-16498 #
AD-A146846 ..... N85-16651 #
AD-A146848 ..... N85-15953 #
AD-A146851 ..... N85-16423 #
AD-A146854 ..... N85-16602 #
AD-A146856 ..... N85-16476 #
AD-A146857 ..... N85-15901 #
AD-A146858 ..... N85-16529 #
AD-A146861 ..... N85-16465 #
AD-A146862 ..... N85-16530 #
AD-A146869 ..... N85-16531 #
AD-A146876 ..... N85-16668 #
AD-A146877 ..... N85-16669 #
AD-A146878 ..... N85-15954 #
AD-A146883 ..... N85-15906 #
AD-A146884 ..... N85-16449 #
AD-A146885 ..... N85-15769 #
AD-A146886 ..... N85-15997 #
AD-A146887 ..... N85-16499 #
AD-A146890 ..... N85-16660 #
AD-A146895 ..... N85-16670 #
AD-A146897 ..... N85-15767 #
AD-A146900 ..... N85-15996 #
AD-A146904 ..... N85-16450 #
AD-A146905 ..... N85-16482 #
AD-A146909 ..... N85-16582 #
AD-A146913 ..... N85-16384 #
AD-A146914 ..... N85-16385 #
AD-A146915 ..... N85-16386 #
AD-A146916 ..... N85-16387 #
AD-A146917 ..... N85-16388 #
AD-A146918 ..... N85-16389 #
AD-A146919 ..... N85-16390 #
AD-A146920 ..... N85-16391 #
AD-A146921 ..... N85-16532 #
AD-A146922 ..... N85-15722 #
AD-A146923 ..... N85-16500 #
AD-A146924 ..... N85-16483 #
AD-A146925 ..... N85-16484 #
AD-A146927 ..... N85-16533 #
AD-A146930 ..... N85-16161 #
AD-A146938 ..... N85-16138 #
AD-A146939 ..... N85-16534 #
AD-A146940 ..... N85-16535 #
AD-A146952 ..... N85-16624 #
AD-A146954 ..... N85-15659 #
AD-A146955 ..... N85-15660 #
AD-A146956 ..... N85-16671 #
AD-A146964 ..... N85-16069 #
AD-A146965 ..... N85-16536 #
AD-A146966 ..... N85-15661 #
AD-A146967 ..... N85-16070 #
AD-A146968 ..... N85-16139 #
AD-A146969 ..... N85-16537 #
AD-A146970 ..... N85-15955 #
AD-A146971 ..... N85-16501 #
AD-A146972 ..... N85-16328 #
AD-A146979 ..... N85-16652 #
AD-A146984 ..... N85-16803 #
AD-A146988 ..... N85-16071 #
AD-A146997 ..... N85-16162 #
AD-A146999 ..... N85-16485 #
AD-A147004 ..... N85-15956 #
AD-A147005 ..... N85-16638 #
AD-A147006 ..... N85-16210 #
AD-A147007 ..... N85-15957 #
AD-A147008 ..... N85-15902 #
AD-A147009 ..... N85-16825 #
AD-A147011 ..... N85-16329 #
AD-A147018 ..... N85-16672 #
AD-A147031 ..... N85-16072 #
AD-A147032 ..... N85-16330 #
AD-A147033 ..... N85-15999 #
AD-A147035 ..... N85-15843 #
AD-A147038 ..... N85-16538 #
AD-A147051 ..... N85-16502 #
AD-A147052 ..... N85-16539 #
AD-A147053 ..... N85-16331 #
AD-A147062 ..... N85-16591 #
AD-A147063 ..... N85-16211 #
AD-A147066 ..... N85-16274 #
AD-A147073 ..... N85-16540 #
AD-A147078 ..... N85-15775 #
AD-A147082 ..... N85-16541 #
AD-A147083 ..... N85-16542 #
AD-A147085 ..... N85-16664 #
AD-A147090 ..... N85-15903 #
AD-A147091 ..... N85-16503 #
AD-A147092 ..... N85-16073 #
AD-A147093 ..... N85-16543 #
AD-A147101 ..... N85-15820 #
AD-A147102 ..... N85-16140 #
AD-A147103 ..... N85-16412 #
AD-A147104 ..... N85-16504 #
AD-A147105 ..... N85-16451 #
AD-A147106 ..... N85-16477 #
AD-A147107 ..... N85-16424 #
AD-A147108 ..... N85-15958 #
AD-A147115 ..... N85-16505 #
AD-A147116 ..... N85-15760 #
AD-A147118 ..... N85-16626 #
AD-A147120 ..... N85-15662 #
AD-A147121 ..... N85-16673 #
AD-A147123 ..... N85-16544 #
AD-A147124 ..... N85-16486 #
AD-A147126 ..... N85-16566 #
AD-A147127 ..... N85-16074 #
AD-A147130 ..... N85-15659 #
AD-A147133 ..... N85-16275 #
AD-A147161 ..... N85-15844 #
AD-A147166 ..... N85-16392 #
AD-A147167 ..... N85-16393 #
AD-A147168 ..... N85-16567 #
AD-A147174 ..... N85-16674 #
AD-A147176 ..... N85-16000 #
AD-A147177 ..... N85-16212 #
AD-A147180 ..... N85-15921 #
AD-A147181 ..... N85-16303 #
AD-A147183 ..... N85-16394 #
AD-A147184 ..... N85-16395 #
AD-A147186 ..... N85-16075 #
AD-A147187 ..... N85-16568 #
AD-A147188 ..... N85-15719 #
AD-A147196 ..... N85-15922 #
AD-A147198 ..... N85-16545 #
AD-A147202 ..... N85-16589 #
AD-A147203 ..... N85-16396 #
AD-A147204 ..... N85-16397 #
AD-A147205 ..... N85-16398 #
AD-A147206 ..... N85-16399 #
AD-A147210 ..... N85-16570 #
AD-A147211 ..... N85-16276 #
AD-A147212 ..... N85-15960 #
AD-A147213 ..... N85-16486 #
AD-A147214 ..... N85-15780 #
AD-A147216 ..... N85-15906 #
AD-A147220 ..... N85-16478 #
AD-A147236 ..... N85-16546 #
AD-A147237 ..... N85-16547 #
AD-A147239 ..... N85-16076 #
AD-A147240 ..... N85-16077 #
AD-A147241 ..... N85-16548 #
AD-A147242 ..... N85-16549 #
AD-A147249 ..... N85-16413 #
AD-A147256 ..... N85-16078* #
AD-A147257 ..... N85-16452 #
AD-A147258 ..... N85-16079 #
AD-A147259 ..... N85-16453 #
AD-A147261 ..... N85-16654 #
AD-A147269 ..... N85-15983 #
AD-A147270 ..... N85-16004 #
AD-A147276 ..... N85-16400 #
AD-A147277 ..... N85-16630 #
AD-A147280 ..... N85-15907 #
AD-A147281 ..... N85-16605 #
AD-A147301 ..... N85-16080 #
AD-A147302 ..... N85-16081 #
AD-A147303 ..... N85-16082 #
AD-A147306 ..... N85-16305 #
AD-A147307 ..... N85-16332 #
AD-A147309 ..... N85-16506 #
AD-A147311 ..... N85-16213 #
AD-A147314 ..... N85-16675 #
AD-A147317 ..... N85-16571 #
AD-A147329 ..... N85-16676 #
AD-A147330 ..... N85-16277 #
AD-A147342 ..... N85-15848 #
AD-A147344 ..... N85-16677 #
AD-A147345 ..... N85-15847 #
AD-A147346 ..... N85-15961 #

AD-A147352 N85-15881 #
AD-A147354 N85-16333 #
AD-A147359 N85-16592 #
AD-A147360 N85-16550 #
AD-A147365 N85-15882 #
AD-A147367 N85-15962 #
AD-A147369 N85-15883 #
AD-A147370 N85-15730 #
AD-A147371 N85-16401 #
AD-A147376 N85-16278 #
AD-A147377 N85-15908 #
AD-A147378 N85-16572 #
AD-A147380 N85-16005 #
AD-A147381 N85-16691 #
AD-A147382 N85-16631 #
AD-A147384 N85-15963 #
AD-A147385 N85-16214 #
AD-A147386 N85-16551 #
AD-A147388 N85-16196 #
AD-A147391 N85-16334 #
AD-A147392 N85-16593 #
AD-A147405 N85-16166 #
AD-A147423 N85-16402 #
AD-A147425 N85-16279 #
AD-A147426 N85-16655 #
AD-A147427 N85-16083 #
AD-A147428 N85-15964 #
AD-A147429 N85-16656 #
AD-A147430 N85-15731 #
AD-A147431 N85-15848 #
AD-A147432 N85-16657 #
AD-A147433 N85-16167 #
AD-A147434 N85-15849 #
AD-A147435 N85-16335 #
AD-A147436 N85-16403 #
AD-A147438 N85-15965 #
AD-A147442 N85-16832 #
AD-A147443 N85-16552 #
AD-A147444 N85-16553 #
AD-A147445 N85-16523 #
AD-A147446 N85-16487 #
AD-A147447 N85-16658 #
AD-A147448 N85-15850 #
AD-A147449 N85-16659 #
AD-A147450 N85-16168 #
AD-A147453 N85-15909 #
AD-A147454 N85-16573 #
AD-A147459 N85-16215 #
AD-A147463 N85-16554 #
AD-A147464 N85-16555 #
AD-A147469 N85-16084 #
AD-A147471 N85-16169 #
AD-A147480 N85-16639* #
AD-A147481 N85-16170 #
AD-A147483 N85-15966 #
AD-A147485 N85-16216 #
AD-A147487 N85-16692 #
AD-A147488 N85-16171 #
AD-A147490 N85-16507 #
AD-A147492 N85-16594 #
AD-A147493 N85-15967 #
AD-A147494 N85-16556 #
AD-A147495 N85-16574 #
AD-A147496 N85-16678 #
AD-A147497 N85-16595 #
AD-A147500 N85-16508 #
AD-A147501 N85-16085 #
AD-A147502 N85-16086 #
AD-A147504 N85-15829 #
AD-A147517 N85-16336 #
AD-A147520 N85-16679 #
AD-A147523 N85-15968 #
AD-A147524 N85-16640 #
AD-A147525 N85-16660 #
AD-A147526 N85-16575 #
AD-A147527 N85-15969 #
AD-A147528 N85-16641 #
AD-A147538 N85-16509 #
AD-A147540 N85-16680 #
AD-A147541 N85-16454 #
AD-A147546 N85-16184 #
AD-A147552 N85-16510 #
AD-A147553 N85-16576 #
AD-A147554 N85-16217 #
AD-A147556 N85-16557 #
AD-A147558 N85-16455 #
AD-A147560 N85-16606 #
AD-A147563 N85-16661 #
AD-A147565 N85-16558 #
AD-A147567 N85-15910 #
AD-A147568 N85-16693 #
AD-A147571 N85-16185 #
AD-A147572 N85-16559 #
AD-A147574 N85-16404 #
AD-A147575 N85-16633 #
AD-A147579 N85-16694 #
AD-A147580 N85-16511 #
AD-A147581 N85-16280 #
AD-A147586 N85-16681 #
AD-A147587 N85-16456 #
AD-A147597 N85-16560 #
AD-A147810 N85-16337 #
AD-A147812 N85-15912 #
AD-A147813 N85-16186 #
AD-A147814 N85-15913 #
AD-A147815 N85-16561 #
AD-A147822 N85-16457 #
AD-A147827 N85-16696 #
AD-A147832 N85-16577 #
AD-A147833 N85-16597 #
AD-A147835 N85-16634 #
AD-A147840 N85-16607 #
AD-A147842 N85-16662 #
AD-A147843 N85-16479 #
AD-A147844 N85-16512 #
AD-A147845 N85-15703 #
AD-A147846 N85-15706 #
AD-A147848 N85-16006 #
AD-A147854 N85-16513 #
AD-A147855 N85-16172 #
AD-A147857 N85-16425 #
AD-A147858 N85-15753 #
AD-A147859 N85-16578 #
AD-A147860 N85-16579 #
AD-A147863 N85-16580 #
AD-A147871 N85-16562 #
AD-A147872 N85-16563 #
AD-A147881 N85-16405 #
AD-A147883 N85-15972 #
AD-A147884 N85-15914 #
AD-A147887 N85-16514 #
AD-A147888 N85-15915 #
AD-A147889 N85-16515 #
AD-A147890 N85-16458 #
AD-A147891 N85-16007 #
AD-A147893 N85-15762 #
AD-A147894 N85-16338 #
AD-A147895 N85-16564 #
AD-A147896 N85-15732 #
AD-A147897 N85-16067 #
AD-A147908 N85-16414 #
AD-A147909 N85-16281 #
AD-A147910 N85-16282 #
AD-A147911 N85-16682 #
AD-A147912 N85-16306 #
AD-A147913 N85-16683 #
AD-A147917 N85-16642 #
AD-A147918 N85-16321 #
AD-A147919 N85-16684 #
AD-A147923 N85-16685 #
AD-A147927 N85-16339 #
AD-A147928 N85-16008 #
AD-A148369 N85-15851 #
AD-D011297 N85-15839 #
AD-D011302 N85-16304 #
AD-D011304 N85-16141 #
AD-D011305 N85-16653 #
AD-D011306 N85-16627 #
AD-D011308 N85-16001 #
AD-D011309 N85-16002 #
AD-D011310 N85-15904 #
AD-D011311 N85-16163 #
AD-D011312 N85-16604 #
AD-D011313 N85-15905 #
AD-D011314 N85-16003 #
AD-D011315 N85-16183 #
AD-D011316 N85-15761 #
AD-D011317 N85-16164 #
AD-D011318 N85-16165 #
AD-D011319 N85-16626 #
AD-D011320 N85-16629 #
AD-D011321 N85-15845 #
AD-D011323 N85-15979
AD-D011324 N85-15704
AD-D011325 N85-15754
AD-D011326 N85-16151
AD-D011327 N85-15935
AD-D011328 N85-15889
AD-D011329 N85-15980
AD-D011331 N85-15981
AD-D011332 N85-16093
AD-D011333 N85-15890
AD-D011334 N85-15982
AD-D011335 N85-16094
AD-D011336 N85-16816
AD-D011337 N85-15874
AD-D011338 N85-15983
AD-D011340 N85-15891
AD-D011341 N85-16152
AD-D011345 N85-16584
AD-D011346 N85-15797 #
AD-D011347 N85-15970 #
AD-D011349 N85-16176
AD-D011350 N85-15936
AD-D011351 N85-16153
AD-D011353 N85-15710
AD-D011354 N85-16154
AD-D011355 N85-16467
AD-D011356 N85-16442
AD-D011357 N85-16646
AD-D011358 N85-16647
AD-D011359 N85-15984
AD-D011360 N85-15799
AD-D011361 N85-15937
AD-D011363 N85-16585
AD-D011364 N85-15938
AD-D011365 N85-15939
AD-D011366 N85-16617
AD-D011370 N85-15911 #
AD-D011371 N85-16695 #
AD-D011372 N85-15971 #
AD-D011373 N85-16142 #
AD-D011374 N85-16596 #
AD-D011375 N85-16155
AD-D011376 N85-15700
AD-D011377 N85-16156
AD-D011378 N85-15940
AD-D011379 N85-16618
AD-D011380 N85-15721
AD-D011381 N85-16342
AD-D011382 N85-15985
AD-D011383 N85-16619
AD-D011384 N85-16307 #
AD-D011385 N85-15986
AD-D011386 N85-15833
AD-D011387 N85-15711
AD-D011389 N85-16620
AD-D011390 N85-16157
AD-D011391 N85-16177
AD-D011392 N85-15941
AD-D011393 N85-15818
AD-D011395 N85-15723
AD-D011396 N85-16158
AD-D011399 N85-16635 #
AD-D011400 N85-16009 #
AD-D011401 N85-16010 #
AD-D011403 N85-15884 #
AD-D011404 N85-16459 #
AD-E440259 N85-15883 #
AD-E751146 N85-16465 #
AD-E850739 N85-16385 #
AD-E850740 N85-16388 #
AD-E850741 N85-16387 #
AD-E850742 N85-16386 #
AD-E850743 N85-16384 #
AD-E850744 N85-15921 #
AD-E850744 N85-16303 #
AD-E850744 N85-16394 #
AD-E850745 N85-16390 #
AD-E850746 N85-16395 #
AD-E850747 N85-16396 #
AD-E850747 N85-16569 #
AD-E850749 N85-16391 #
AD-E850750 N85-16392 #
AD-E850751 N85-16399 #
AD-E850752 N85-16389 #
AD-E850753 N85-16393 #
AD-E850754 N85-16398 #
AD-E850755 N85-16397 #
AD-E950598 N85-16401 #
AD-E950602 N85-15730 #
AD-E950608 N85-16692 #
AD-E950610 N85-16171 #
AD-F300486 N85-15882 #
AD-F300486 N85-15962 #
AD-F300486 N85-16550 #
AD-F300486 N85-16592 #
AD-F300488 N85-16508 #
AD-F300490 N85-15967 #
AD-F300490 N85-16556 #
AD-F300490 N85-16574 #
AD-F300490 N85-16594 #
AD-F300490 N85-16595 #
AD-F300490 N85-16678 #
AD-F300491 N85-16216 #
AD-F300504 N85-16507 #
AD-1984-904 N85-16522 #
AERE-R-11229 N85-16149 #
AERE-R-11262 N85-16203 #
AERO-1291 N85-15661 #
AEROCHEM-TP-445 N85-15841 #

AFAMRL-TR-78-109-ADD-1 N85-16503 #
AFAMRL-TR-84-001 N85-16425 #
AFAMRL-TR-84-040 N85-16182 #
AFAMRL-TR-84-049 N85-16453 #

AFESC/DEB-TR-84-01 N85-15762 #

AFESC/ESL-TR-83-34 N85-15760 #

AFFTC-TIM-84-4 N85-16485 #

AFGL-ERP-878 N85-16332 #
AFGL-ERP-882 N85-16641 #
AFGL-ERP-883 N85-16403 #
AFGL-ERP-884 N85-16640 #

AFGL-TR-84-0006 N85-16336 #
AFGL-TR-84-0128 N85-16334 #
AFGL-TR-84-0135 N85-16332 #
AFGL-TR-84-0143 N85-16280 #
AFGL-TR-84-0161 N85-16641 #
AFGL-TR-84-0162 N85-16403 #
AFGL-TR-84-0170 N85-16640 #
AFGL-TR-84-0277 N85-16402 #
AFGL-TR-84-0289 N85-16333 #

AFHRL-SR-84-15 N85-16694 #

AFHRL-TP-83-63 N85-16196 #
AFHRL-TP-84-32 N85-16466 #

AFIT/CI/NR-84-68D N85-16691 #
AFIT/CI/NR-84-81T N85-16512 #
AFIT/CI/NR-84-82T N85-16684 #
AFIT/CI/NR-84-85D N85-16606 #
AFIT/CI/NR-84-92D N85-16321 #

AFIT/GEM/LSM/84S-10 N85-16303 #
AFIT/GEM/LSM/84S-15 N85-16671 #

AFIT/GLM/LSM/84S-8 N85-15775 #
AFIT/GLM/LSM/84S-14 N85-16673 #
AFIT/GLM/LSM/84S-18 N85-16677 #
AFIT/GLM/LSM/84S-24 N85-16576 #
AFIT/GLM/LSM/84S-26 N85-15660 #
AFIT/GLM/LSM/84S-30 N85-16676 #
AFIT/GLM/LSM/84S-32 N85-16478 #
AFIT/GLM/LSM/84S-35 N85-16502 #
AFIT/GLM/LSM/84S-48 N85-16454 #
AFIT/GLM/LSM/84S-50 N85-16678 #
AFIT/GLM/LSM/84S-52 N85-16008 #
AFIT/GLM/LSM/84S-55 N85-16672 #
AFIT/GLM/LSM/84S-56 N85-15663 #
AFIT/GLM/LSM/84S-57 N85-15662 #
AFIT/GLM/LSM/84S-63 N85-15921 #

AFIT/GSM/LSY/84S-2 N85-15659 #
AFIT/GSM/LSY/84S-19 N85-16510 #

AFOSR-82-0095A N85-16333 #
AFOSR-84-0812TR N85-15829 #
AFOSR-84-0833TR N85-15999 #
AFOSR-84-0856TR N85-15820 #
AFOSR-84-0858TR N85-16070 #
AFOSR-84-0859TR N85-16074 #
AFOSR-84-0860TR N85-15843 #
AFOSR-84-0861TR N85-16069 #
AFOSR-84-0863TR N85-16537 #
AFOSR-84-0864TR N85-16690 #
AFOSR-84-0867TR N85-16504 #
AFOSR-84-0868TR N85-15959 #
AFOSR-84-0869TR N85-16664 #
AFOSR-84-0870TR N85-16542 #
AFOSR-84-0872TR N85-16533 #
AFOSR-84-0878TR N85-16329 #
AFOSR-84-0879TR N85-16500 #
AFOSR-84-0880TR N85-16530 #
AFOSR-84-0889TR N85-16136 #
AFOSR-84-0891TR N85-16582 #
AFOSR-84-0897TR N85-16539 #
AFOSR-84-0902TR N85-16506 #
AFOSR-84-0907TR N85-16331 #
AFOSR-84-0908TR N85-16330 #
AFOSR-84-0909TR N85-16073 #
AFOSR-84-0910TR N85-16212 #
AFOSR-84-0914TR N85-16075 #
AFOSR-84-0916TR N85-16568 #
AFOSR-84-0917TR N85-16581 #
AFOSR-84-0919TR N85-16528 #
AFOSR-84-0945TR N85-16634 #
AFOSR-84-0947TR N85-16564 #
AFOSR-84-0951TR N85-16563 #
AFOSR-84-0957TR N85-16562 #
AFOSR-84-0974TR N85-16662 #
AFOSR-84-0978TR N85-16007 #
AFOSR-84-0985TR N85-16607 #

AFOSR-84-0989TR N85-16577 #
AFOSR-84-0990TR N85-16590 #
AFOSR-84-1002TR N85-15753 #
AFOSR-84-1054TR N85-16578 #
AFOSR-84-1059TR N85-16579 #
AFOSR-84-1066TR N85-16067 #

AFRPL-TR-84-053 N85-15849 #

AFWAL-TR-84-1016 N85-15722 #
AFWAL-TR-84-2014 N85-15731 #
AFWAL-TR-84-2032 N85-16000 #
AFWAL-TR-84-3006 N85-16213 #
AFWAL-TR-84-4042 N85-16162 #

AFWL-TN-84-14 N85-16612 #
AFWL-TN-84-30 N85-16067 #

AFWL-TR-83-132 N85-15848 #
AFWL-TR-84-07 N85-15997 #
AFWL-TR-84-14 N85-16160 #
AFWL-TR-84-92 N85-16139 #

AGARD-CP-368 N85-15733 #
AGARD-CP-375 N85-15664 #

AGARD-LS-136 N85-15809 #

AI-M-774 N85-16515 #
AI-M-776 N85-16458 #
AI-M-796 N85-16513 #

AIAA-PAPER-84-2070-CP N85-15752* #

AIAA-83-0503 N85-15696* #
AIAA-85-0090 N85-15758* #
AIAA-85-0237 N85-15726* #
AIAA-85-0307 N85-15687* #
AIAA-85-0316 N85-15756* #
AIAA-85-0338 N85-15702* #
AIAA-85-0379 N85-15757* #
AIAA-85-0380 N85-15688* #

AMSMI/RK-CR-84-3 N85-15730 #

AMSMI/RR-TR-84-6 N85-16401 #

AMTE(M)-R-83003 N85-15770

ANAMET-ASIAC-1183.1A N85-16213 #

APRO-83-01-F N85-16666 #

AR-1 N85-15840 #
AR-1 N85-16445 #
AR-7 N85-16602 #
AR-31 N85-15998 #
AR-003-948 N85-16097 #

ARAP-TM-84-12 N85-16085 #

ARAP-508 N85-16590* #

ARBRL-MR-03379 N85-16508 #

ARI-RN-84-124 N85-16475 #
ARI-RN-84-125 N85-16476 #
ARI-RN-84-129 N85-16680 #

ARL-STRUC-TM-385 N85-16097 #

ARLCB-TR-84031 N85-15883 #

ARO-16180.14-PH N85-15996 #
ARO-17432.13-PH N85-16623 #
ARO-17508.8-GS N85-16276 #
ARO-17692.3-GS N85-16327 #
ARO-17905.9-CH N85-15910 #
ARO-17907.12-EG N85-16217 #
ARO-17911.3-CH N85-15846 #
ARO-17942.8-MS N85-15906 #
ARO-17962.50-EL N85-15953 #
ARO-18005.4-CH N85-15842 #
ARO-18020.5-EL N85-16851 #
ARO-18054.11-EL N85-16005 #
ARO-18197.5-MA N85-16538 #
ARO-18197.6-MA N85-16540 #
ARO-18307.15-PH N85-16630 #
ARO-18559.17-CH N85-15903 #
ARO-18577.3-MS N85-15828 #
ARO-18687.8-GS N85-16215 #
ARO-19367.17-MA N85-16527 #
ARO-19367.18-MA N85-16529 #
ARO-19601.1-PH N85-15996 #
ARO-20980.4-MA N85-16526 #
ARO-21396.1-EG-CF N85-15841 #

ATR-21 N85-16425 #

BAM-ERP-2415 N85-16218 #

BBN-5657 N85-16503 #

BLL-CTO-2267-(9091.9F) N85-16150

BLL-DOUNREAY-TR-934-(9091.9F) N85-16092
BLL-DOUNREAY-TR-937-(9091.9F) N85-16174

BLL-M-35993-(5828.4) N85-16175
BLL-M-35995-(5828.4) N85-15866
BLL-M-36000-(5828.4) N85-16599
BLL-M-36002-(5828.4) N85-15867
BLL-M-36003-(5828.4) N85-15870
BLL-M-36004-(5828.4) N85-15854 #
BLL-M-36010-(5828.4) N85-16524
BLL-M-36011-(5828.4) N85-16202
BLL-M-36012-(5828.4) N85-15871
BLL-M-36013-(5828.4) N85-15872
BLL-M-36014-(5828.4) N85-16057
BLL-M-36015-(5828.4) N85-16058
BLL-M-36019-(5828.4) N85-15832
BLL-M-36020-(5828.4) N85-15868
BLL-M-36023-(5828.4) N85-15873
BLL-M-36027-(5828.4) N85-15856
BLL-M-36028-(5828.4) N85-15855
BLL-M-36033-(5828.4) N85-15869

BLL-MINTEK-TR-1168-(5810.5759) N85-15864
BLL-MINTEK-TR-1177-(5810.5759) N85-15863

BLL-PNR-90240-(8019.3153) N85-15859

BLL-RISLEY-TR-4527-(9091.9F) N85-15860
BLL-RISLEY-TR-4541-(9091.9F) N85-16199 #
BLL-RISLEY-TR-4546-(9091-9F) N85-15861
BLL-RISLEY-TR-4547-(9091.9F) N85-16194
BLL-RISLEY-TR-4586-(9091.9F) N85-16583
BLL-RISLEY-TR-4608-(9091.9F) N85-15926
BLL-RISLEY-TR-4979-(9091.9F) N85-16091
BLL-RISLEY-TR-5044-(9091.9F) N85-15857

BLL-TRANS-5043-(9091.9F) N85-15858

BLL-T6383/BG/WH798/84 N85-15865
BLL-T6385/BG/WH800/84 N85-15862

BLL-WH-595-(9091.9F) N85-16645
BLL-WH-603-(9091.9F) N85-16056
BLL-WH-610-(9091.9F) N85-16520
BLL-WH-611-(9091.9F) N85-15978
BLL-WH-762-(9091.9F) N85-16319

BM-OFR-168-84 N85-16286 #

BMFT-FB-T-84-184 N85-15807 #
BMFT-FB-T-84-192 N85-16308 #
BMFT-FB-T-84-193 N85-16309 #
BMFT-FB-T-84-203 N85-16012 #
BMFT-FB-T-84-208 N85-15830 #
BMFT-FB-T-84-211 N85-15917 #

BMFT-FB-W-84-030 N85-16285 #
BMFT-FB-W-84-035 N85-16011 #
BMFT-FB-W-84-043 N85-15808 #

BN-1022 N85-16531 #
BN-1027 N85-16535 #

BRDC-2394 N85-16185 #
BRDC-2396 N85-16184 #

BRL-MR-3380 N85-16216 #

BRL-TR-2597 N85-16507 #

BR90072 N85-15770
BR92739 N85-15967
BR93462 N85-15712 #
BR93483 N85-16600 #

B8469217 N85-16408 #
B8470307 N85-16522 #
B8471111 N85-16409 #
B8471174 N85-16516 #
B8473609 N85-15863 #
B8473799 N85-16407 #

CADD-8312-3001 N85-16494 #

CCA-83-14 N85-16518 #

CCMS-84-13 N85-15821* #

CE-PH-84-9 ..... N85-16276 #

CECOM-82-J071-3 ..... N85-16625 #

CERL-TR-E-202 ..... N85-16306 #

CERL-TR-P-85/01 ..... N85-16683 #

CH-331/84 ..... N85-16322 #
CH-334/84 ..... N85-16615 #

CMU-CS-84-132 ..... N85-16486 #

CONF-831142-3 ..... N85-15916* #
CONF-840417-3 ..... N85-15885 #
CONF-840736-5 ..... N85-16596 #
CONF-840776-1 ..... N85-16644 #
CONF-840786-3 ..... N85-16610 #
CONF-840793-5 ..... N85-16187 #
CONF-840922-1 ..... N85-16643 #
CONF-841196-1 ..... N85-16188 #
CONF-850606-1 ..... N85-16189 #
CONF-8404190-3 ..... N85-16609 #
CONF-8406156-4 ..... N85-16608 #
CONF-8406209-1 ..... N85-16406 #
CONF-8409108-1 ..... N85-16488 #
CONF-8409132-1 ..... N85-16197 #

CR-4-998 ..... N85-15994* #

CRC-CAPM-48-83-02 ..... N85-16462 #

CRDC-TR-84083 ..... N85-16624 #

CRINC/RSL-TR-3311-1 ..... N85-15963 #

CRREL-MONO-84-3 ..... N85-16278 #

CRREL-SR-84-23 ..... N85-16277 #
CRREL-SR-84-25 ..... N85-15912 #

CRREL-84-14 ..... N85-16424 #
CRREL-84-17 ..... N85-15958 #
CRREL-84-18 ..... N85-16279 #
CRREL-84-19 ..... N85-16274 #

CS/E-84-004 ..... N85-16504 #
CS/E-84-005 ..... N85-16500 #

CSC/TR-84/6005 ..... N85-15951 #

CSIRO-TP-6 ..... N85-16324 #

CU-CS-272-84 ..... N85-16538 #

CWP-016 ..... N85-16541 #

CWRU/DC/TR15 ..... N85-15844 #

D-5 ..... N85-15887 #
D-82 ..... N85-16221 #

DE84-014774 ..... N85-16488 #
DE84-014982 ..... N85-16189 #
DE84-015372 ..... N85-16644 #
DE84-016843 ..... N85-16598 #
DE84-901335 ..... N85-16283 #
DE85-000897 ..... N85-15885 #
DE85-000899 ..... N85-16609 #
DE85-001272 ..... N85-16406 #
DE85-001280 ..... N85-16608 #
DE85-001286 ..... N85-16610 #
DE85-001552 ..... N85-15916* #
DE85-001591 ..... N85-16197 #
DE85-001751 ..... N85-16188 #
DE85-001788 ..... N85-16643 #
DE85-001897 ..... N85-16187 #
DE85-002116 ..... N85-16068 #

DFVLR-FB-79-11 ..... N85-16284 #
DFVLR-FB-84-29 ..... N85-16220 #
DFVLR-FB-84-30 ..... N85-16192 #

DFVLR-MITT-84-09 ..... N85-15763 #
DFVLR-MITT-84-16 ..... N85-15709 #

DMAHTC-84-039 ..... N85-16275 #

DOD/DF-85/002A ..... N85-16495 #

DOE/CS-54209/24 ..... N85-15982* #

DOE/ER-13164/T1 ..... N85-16088 #

DOE/ET-20356/18 ..... N85-16295* #

DOE/JPL-106-79 ..... N85-16298* #
DOE/JPL-1012-102 ..... N85-16296* #

DOE/NASA/0030-1 ..... N85-15895* #
DOE/NASA/0215-1 ..... N85-16300* #
DOE/NASA/0290-1 ..... N85-16291* #
DOE/NASA/0339-1 ..... N85-16698* #
DOE/NASA/0342-1 ..... N85-16699* #
DOE/NASA/20320-61 ..... N85-16299* #

DOT/FAA/AT-84/2 ..... N85-15707 #

DOT/FAA/EE-84-04 ..... N85-16595 #

DP-MS-84-70 ..... N85-16189 #

DRIC-BR-92844 ..... N85-15708 #

DRIC-T-7147 ..... N85-15987

DRSMI/RD-CR-84-19 ..... N85-16692 #

DRSMI/RH-CR-84-13 ..... N85-16171 #

DTNSRDC-84/047 ..... N85-16072 #
DTNSRDC-84/052 ..... N85-15661 #

D6-52147 ..... N85-15714* #

E-2068 ..... N85-15896* #
E-2183 ..... N85-16099* #
E-2197 ..... N85-15658* #
E-2201 ..... N85-15822* #
E-2296 ..... N85-16195* #
E-2302 ..... N85-16100* #
E-2313 ..... N85-15897* #
E-2319 ..... N85-15823* #
E-2348 ..... N85-16663* #
E-2365 ..... N85-16096* #
E-2369 ..... N85-15725* #
E-2386 ..... N85-15893* #
E-2394 ..... N85-15878* #
E-2396 ..... N85-15779* #
E-2398 ..... N85-16205* #
E-2404 ..... N85-15727* #
E-2405 ..... N85-15688* #
E-2408 ..... N85-15689* #
E-2410 ..... N85-16299* #
E-2413 ..... N85-15757* #
E-2414 ..... N85-15758* #
E-2416 ..... N85-15895* #
E-2418 ..... N85-15726* #
E-2421 ..... N85-15702* #

ECTB-115-22A ..... N85-16013 #

EL-847 ..... N85-15800 #

EOARD-TR-84-10 ..... N85-15852 #
EOARD-TR-84-18 ..... N85-16464 #
EOARD-TR-85-03 ..... N85-15703 #

EPA/600-2-84-149 ..... N85-16146 #

ERIM-164000-13-P ..... N85-16268* #
ERIM-166500-4-F ..... N85-16269* #

ESA-SP-213 ..... N85-16700 #

ESA-TT-624 ..... N85-16284 #
ESA-TT-895 ..... N85-15763 #

ESD-TR-84-006 ..... N85-16656 #
ESD-TR-84-035 ..... N85-15769 #
ESD-TR-84-193 ..... N85-16693 #
ESD-TR-84-195 ..... N85-16696 #

ETL-0359-1 ..... N85-16689 #
ETL-0364 ..... N85-16400 #

E85-10040 ..... N85-16241* #
E85-10041 ..... N85-16242* #
E85-10042 ..... N85-16243* #
E85-10044 ..... N85-16244* #
E85-10049 ..... N85-16245* #
E85-10050 ..... N85-16246* #
E85-10051 ..... N85-16247* #
E85-10052 ..... N85-16248* #
E85-10053 ..... N85-16249* #
E85-10055 ..... N85-16250* #
E85-10056 ..... N85-16251* #
E85-10057 ..... N85-16268* #
E85-10058 ..... N85-16269* #
E85-10059 ..... N85-16270* #
E85-10060 ..... N85-16271* #
E85-10061 ..... N85-16272* #

F+W-FO-1699 ..... N85-16143 #

FAA-CT-84-12 ..... N85-15919 #
FAA-CT-84-15 ..... N85-15920 #

FAA/EE-84-15 ..... N85-16593 #

FI-13-TBR-18 ..... N85-15974 #
FI-44-TBR-93 ..... N85-15973 #

FNP-400/84 ..... N85-15768 #

FOA-C-20543-T1 ..... N85-16340 #
FOA-C-20549-D3 ..... N85-15771 #
FOA-C-20550-D1 ..... N85-16173 #
FOA-C-20551-D2 ..... N85-15868 #
FOA-C-20552-D2(E4,F9) ..... N85-15831 #
FOA-C-20554-D4-PT-1 ..... N85-15923 #
FOA-C-20555-D1 ..... N85-15924 #
FOA-C-20559-D8(E3) ..... N85-15720 #
FOA-C-30368-E1,E4 ..... N85-16145 #
FOA-C-30374-E1 ..... N85-15975 #
FOA-C-54058-H1 ..... N85-16193 #

FR84-75-717 ..... N85-16159* #
FR1021 ..... N85-16325* #

FSRP/SO-211 ..... N85-16290 #

FSU-STATISTICS-M676 ..... N85-16529 #
FSU-STATISTICS-M686 ..... N85-16527 #

FTD-ID(RS)T-1118-84 ..... N85-15696 #

GAO/NSIAD-85-2 ..... N85-16682 #

GC-TR-84-386 ..... N85-16626 #

GEC/DIS/TR-84-B1V-2 ..... N85-16511 #

GFDI-CONTRIB-204 ..... N85-16413 #

GRI-84/0065 ..... N85-16287 #
GRI-84/0080 ..... N85-15928 #
GRI-84/0086 ..... N85-15918 #
GRI-84/0113 ..... N85-15925 #
GRI-84/0141 ..... N85-15927 #

GTEC31-4773 ..... N85-16300* #

H-1194 ..... N85-15713* #
H-1252 ..... N85-15752* #
H-1269 ..... N85-15729* #
H-1273 ..... N85-15687* #
H-1280 ..... N85-15756* #

HEL-TN-11-84 ..... N85-15954 #

HS236-9060-VOL-1 ..... N85-16270* #

HUMRRO-FR-MTRD(TX)-80-9 ..... N85-16475 #
HUMRRO-FR-MTRD(TX)-82-22 ..... N85-16476 #

IA-128/84 ..... N85-16144 #

IBBC-TNO-B-76-35/04.2.02013 ..... N85-15926

ICASE-84-60 ..... N85-16064* #
ICASE-84-64 ..... N85-16063* #
ICASE-85-1 ..... N85-16525* #

IDI-18309 ..... N85-15826* #

IFSM-84-127 ..... N85-16214 #

IIHR-284 ..... N85-16083 #

ILF-MITT-138 ..... N85-15776 #

INPE-2803-PRE/363 ..... N85-15805* #
INPE-3243-PRE/589 ..... N85-16248* #

IR-3 ..... N85-16625 #
IR-5 ..... N85-16411 #

IS-4872 ..... N85-15766* #

ISBN-0-902553-31-3 ..... N85-16102 #
ISBN-92-63-00632-6 ..... N85-16352 #
ISBN-92-835-0360-0 ..... N85-15809 #
ISBN-92-835-0362-7 ..... N85-15733 #
ISBN-92-835-0363-5 ..... N85-15664 #
ISBN-951-38-2109-9 ..... N85-16460 #

ISIL-V-4062-05 ..... N85-16675 #

ISR-1 ..... N85-16333 #

ISSN-0082-5263 ..... N85-16061 #
ISSN-0170-1339 ..... N85-15808 #
ISSN-0170-1339 ..... N85-16011 #
ISSN-0170-1339 ..... N85-16285 #
ISSN-0309-099X ..... N85-16102 #
ISSN-0340-7608 ..... N85-15807 #
ISSN-0340-7608 ..... N85-15830 #
ISSN-0340-7608 ..... N85-15917 #
ISSN-0340-7608 ..... N85-16012 #
ISSN-0340-7608 ..... N85-16308 #
ISSN-0340-7608 ..... N85-16309 #
ISSN-0347-3694 ..... N85-15720 #
ISSN-0347-3694 ..... N85-15771 #
ISSN-0347-3694 ..... N85-15831 #
ISSN-0347-3694 ..... N85-15888 #
ISSN-0347-3694 ..... N85-15923 #
ISSN-0347-3694 ..... N85-15924 #
ISSN-0347-3694 ..... N85-16173 #
ISSN-0347-3694 ..... N85-16340 #
ISSN-0347-3708 ..... N85-15975 #
ISSN-0347-3708 ..... N85-16145 #
ISSN-0347-7665 ..... N85-16193 #
ISSN-0358-5077 ..... N85-16460 #
ISSN-0366-0885 ..... N85-15887 #
ISSN-0366-0885 ..... N85-16221 #
ISSN-0366-9106 ..... N85-15800 #
ISSN-0379-6566 ..... N85-16700 #
ISSN-0721-5320 ..... N85-15886 #
ISSN-0721-5320 ..... N85-16219 #
ISSN-0722-3838 ..... N85-16686 #
ISSN-0722-3838 ..... N85-16687 #

ISWS/CIR-162/84 ..... N85-16289 #

ITR-1 ..... N85-15913 #

JPL-PUBL-84-48 ..... N85-15989* #
JPL-PUBL-84-49 ..... N85-15990* #
JPL-PUBL-84-60 ..... N85-15819* #
JPL-PUBL-84-62 ..... N85-15701* #
JPL-PUBL-84-65 ..... N85-16294* #
JPL-PUBL-84-66 ..... N85-16491* #
JPL-PUBL-84-67 ..... N85-15798* #
JPL-PUBL-84-70 ..... N85-15991* #
JPL-PUBL-84-71 ..... N85-16295* #
JPL-PUBL-84-72 ..... N85-16296* #
JPL-PUBL-84-73 ..... N85-16297* #
JPL-PUBL-84-77 ..... N85-16298* #
JPL-PUBL-84-92 ..... N85-15992* #

JPRS-UBB-84-015 ..... N85-16416 #
JPRS-UBB-84-027 ..... N85-16426 #

JPRS-UEE-84-017 ..... N85-16025 #
JPRS-UEE-84-018 ..... N85-16014 #

JPRS-UEN-84-038 ..... N85-16312 #

JPRS-UES-84-008 ..... N85-16223 #

JPRS-WST-84-039 ..... N85-15929 #

JUEL-1913 ..... N85-15887 #
JUEL-1939 ..... N85-16221 #

KNMI-TR-51 ..... N85-16407 #
KNMI-TR-52 ..... N85-16408 #
KNMI-TR-53 ..... N85-16409 #
KNMI-TR-55 ..... N85-15853 #

KU-FRL-487-1 ..... N85-15692* #

L-5515 ..... N85-16589* #
L-15645 ..... N85-16065* #
L-15646 ..... N85-15695* #
L-15682 ..... N85-15694* #
L-15723 ..... N85-15755* #
L-15777 ..... N85-16066* #
L-15813 ..... N85-15778* #
L-15846 ..... N85-16587* #
L-15850 ..... N85-16565* #
L-15910 ..... N85-16343* #

LAIR-181 ..... N85-16444 #

LARS-TR-061584 ..... N85-16243* #
LARS-TR-062984 ..... N85-16242* #
LARS-TR-073184 ..... N85-16241* #

LBF-FB-170/84 ..... N85-15886 #
LBF-FB-172/84 ..... N85-16219 #

LC-84-601136 ..... N85-15781 #

LCS-TR-2 ..... N85-16573 #
LCS-TR-3 ..... N85-16559 #
LCS-TR-4 ..... N85-16571 #

LDGOOS-20081 ..... N85-16594 #

LEMSCO-19346-VOL-1 ..... N85-15777* #

LIDS-P-1398 ..... N85-16674 #
LIDS-P-1402 ..... N85-16526 #

LMI-DC301-A ..... N85-16689 #
LMI-DC301-B ..... N85-16688 #

LMSC-D973437 ..... N85-16302* #

LMSC-HREC-TN-D951714 ..... N85-16181* #
LMSC-HREC-TN-D951725 ..... N85-16208* #

LMSC-HREC-TR-D867400-1-VOL-1 ..... N85-15801* #
LMSC-HREC-TR-D867400-2-VOL-2 ..... N85-15802* #
LMSC-HREC-TR-D867400-3-VOL-3 ..... N85-15803* #

LMSC/F018810 ..... N85-15767 #

LP-119 ..... N85-15988* #

LR-29801 ..... N85-15718* #

LSI-TR-376-30 ..... N85-16292* #

MDC-J2990 ..... N85-16087 #
MDC-J3527 ..... N85-16069 #

ME124(84)AFOSR-993-1 ..... N85-16212 #

MIMEO SER-1555 ..... N85-16563 #

MRC-TSR-2719 ..... N85-16560 #
MRC-TSR-2720 ..... N85-16552 #
MRC-TSR-2721 ..... N85-16556 #
MRC-TSR-2722 ..... N85-16574 #
MRC-TSR-2723 ..... N85-16553 #
MRC-TSR-2724 ..... N85-16557 #
MRC-TSR-2725 ..... N85-16004 #
MRC-TSR-2726 ..... N85-16546 #
MRC-TSR-2727 ..... N85-16549 #
MRC-TSR-2728 ..... N85-16548 #
MRC-TSR-2729 ..... N85-16569 #
MRC-TSR-2730 ..... N85-16077 #
MRC-TSR-2731 ..... N85-16076 #
MRC-TSR-2733 ..... N85-16547 #
MRC-TSR-2734 ..... N85-16544 #
MRC-TSR-2735 ..... N85-16080 #
MRC-TSR-2737 ..... N85-16555 #
MRC-TSR-2738 ..... N85-16575 #
MRC-TSR-2739 ..... N85-16082 #
MRC-TSR-2740 ..... N85-16081 #
MRC-TSR-2741 ..... N85-16554 #
MRC-TSR-2743 ..... N85-16550 #
MRC-TSR-2744 ..... N85-16551 #

MRDC41090.3FR ..... N85-16582 #
MRDC41116.1IR ..... N85-16662 #

MTU-TB-908/84 ..... N85-16190 #
MTU-TB-910/84 ..... N85-16191 #

NADC-84077-60 ..... N85-15699 #
NADC-84104-20-SUPPL ..... N85-16343* #
NADC-84124-60 ..... N85-15861 #

NAPC-PE-107C ..... N85-15922 #

NAS 1.15:77292 ..... N85-16180* #
NAS 1.15:77429 ..... N85-15898* #
NAS 1.15:77440 ..... N85-16421* #
NAS 1.15:77468 ..... N85-15968* #
NAS 1.15:77475 ..... N85-15942* #
NAS 1.15:77498 ..... N85-16648* #
NAS 1.15:77501 ..... N85-15826* #
NAS 1.15:77517 ..... N85-16422* #
NAS 1.15:77624 ..... N85-15765* #
NAS 1.15:77726 ..... N85-15805* #
NAS 1.15:77751 ..... N85-16207* #
NAS 1.15:77752 ..... N85-15876* #
NAS 1.15:77753 ..... N85-15879* #
NAS 1.15:77754 ..... N85-15835* #
NAS 1.15:77760 ..... N85-16697* #
NAS 1.15:77762 ..... N85-15684* #
NAS 1.15:77773 ..... N85-16206* #
NAS 1.15:77779 ..... N85-16301* #
NAS 1.15:77784 ..... N85-16637* #
NAS 1.15:77787 ..... N85-15836* #
NAS 1.15:77794 ..... N85-15837* #
NAS 1.15:77805 ..... N85-15834* #

NAS 1.15:83096 ..... N85-16730* #
NAS 1.15:83711 ..... N85-15896* #
NAS 1.15:83748 ..... N85-15658* #
NAS 1.15:84302 ..... N85-15718* #
NAS 1.15:84583 ..... N85-15696* #
NAS 1.15:84589 ..... N85-15697* #
NAS 1.15:84914 ..... N85-15713* #
NAS 1.15:85674 ..... N85-15695* #
NAS 1.15:85905 ..... N85-15752* #
NAS 1.15:85916 ..... N85-15729* #
NAS 1.15:85920 ..... N85-15687* #
NAS 1.15:85924 ..... N85-15756* #
NAS 1.15:86150 ..... N85-16726* #
NAS 1.15:86167 ..... N85-16273* #
NAS 1.15:86173 ..... N85-16729* #
NAS 1.15:86274 ..... N85-15755* #
NAS 1.15:86296 ..... N85-16587* #
NAS 1.15:86312 ..... N85-15728* #
NAS 1.15:86325 ..... N85-16062* #
NAS 1.15:86338 ..... N85-15796* #
NAS 1.15:86341 ..... N85-15694* #
NAS 1.15:86345 ..... N85-15657* #
NAS 1.15:86356 ..... N85-15691* #
NAS 1.15:86460 ..... N85-15773* #
NAS 1.15:86486 ..... N85-16320* #
NAS 1.15:86663 ..... N85-16724* #
NAS 1.15:86685 ..... N85-16663* #
NAS 1.15:86896 ..... N85-15725* #
NAS 1.15:86898 ..... N85-16096* #
NAS 1.15:86905 ..... N85-15878* #
NAS 1.15:86907 ..... N85-15779* #
NAS 1.15:86908 ..... N85-16205* #
NAS 1.15:86909 ..... N85-15823* #
NAS 1.15:86911 ..... N85-15727* #
NAS 1.15:86912 ..... N85-15688* #
NAS 1.15:86914 ..... N85-15689* #
NAS 1.15:86915 ..... N85-15893* #
NAS 1.15:86918 ..... N85-16299* #
NAS 1.15:86919 ..... N85-15757* #
NAS 1.15:86920 ..... N85-15758* #
NAS 1.15:86923 ..... N85-15726* #
NAS 1.15:86924 ..... N85-15822* #
NAS 1.15:86925 ..... N85-15702* #
NAS 1.15:86927 ..... N85-15897* #
NAS 1.15:87405 ..... N85-16247* #
NAS 1.21:481 ..... N85-16685* #
NAS 1.26:3840 ..... N85-15714* #
NAS 1.26:3951 ..... N85-16195* #
NAS 1.26:3962 ..... N85-16588* #
NAS 1.26:3963 ..... N85-15692* #
NAS 1.26:3964 ..... N85-16590* #
NAS 1.26:166043 ..... N85-15993* #
NAS 1.26:166437 ..... N85-15717* #
NAS 1.26:166601 ..... N85-16490* #
NAS 1.26:166609 ..... N85-15715* #
NAS 1.26:166612 ..... N85-15795* #
NAS 1.26:166613 ..... N85-15793* #
NAS 1.26:166614 ..... N85-15794* #
NAS 1.26:166615 ..... N85-16469* #
NAS 1.26:167817 ..... N85-15827* #
NAS 1.26:168222 ..... N85-16300* #
NAS 1.26:168259 ..... N85-15806* #
NAS 1.26:169497 ..... N85-15718* #
NAS 1.26:171271 ..... N85-15880* #
NAS 1.26:171278 ..... N85-15772* #
NAS 1.26:171281 ..... N85-16208* #
NAS 1.26:171282 ..... N85-16181* #
NAS 1.26:171283 ..... N85-16325* #
NAS 1.26:171284 ..... N85-15766* #
NAS 1.26:171289 ..... N85-15824* #
NAS 1.26:171290 ..... N85-15825* #
NAS 1.26:171296 ..... N85-15764* #
NAS 1.26:171818 ..... N85-16243* #
NAS 1.26:171819 ..... N85-16251* #
NAS 1.26:171820 ..... N85-15777* #
NAS 1.26:171821 ..... N85-16241* #
NAS 1.26:171822 ..... N85-16242* #
NAS 1.26:171823 ..... N85-16468* #
NAS 1.26:171826 ..... N85-15801* #
NAS 1.26:171827 ..... N85-15802* #
NAS 1.26:171828 ..... N85-15803* #
NAS 1.26:171831 ..... N85-16611* #
NAS 1.26:172338-ADD ..... N85-15706* #
NAS 1.26:172407 ..... N85-16489* #
NAS 1.26:172456 ..... N85-15695* #
NAS 1.26:172471 ..... N85-16098* #
NAS 1.26:172477 ..... N85-15994* #
NAS 1.26:172493 ..... N85-15686* #
NAS 1.26:172498 ..... N85-16204* #
NAS 1.26:172500 ..... N85-16525* #
NAS 1.26:172503 ..... N85-16064* #
NAS 1.26:172504 ..... N85-16063* #
NAS 1.26:172505 ..... N85-16480* #
NAS 1.26:172511 ..... N85-16588* #
NAS 1.26:174188 ..... N85-16248* #
NAS 1.26:174210 ..... N85-16178* #

NAS 1.26:174219 ..... N85-15821* #
NAS 1.26:174221 ..... N85-16244* #
NAS 1.26:174225 ..... N85-16245* #
NAS 1.26:174226 ..... N85-16246* #
NAS 1.26:174227 ..... N85-16249* #
NAS 1.26:174228 ..... N85-16250* #
NAS 1.26:174229 ..... N85-16268* #
NAS 1.26:174230 ..... N85-16269* #
NAS 1.26:174231 ..... N85-16270* #
NAS 1.26:174232 ..... N85-16271* #
NAS 1.26:174242 ..... N85-16272* #
NAS 1.26:174246 ..... N85-15724* #
NAS 1.26:174247 ..... N85-16622* #
NAS 1.26:174248 ..... N85-16621* #
NAS 1.26:174249 ..... N85-16095* #
NAS 1.26:174250 ..... N85-16060* #
NAS 1.26:174252 ..... N85-16323* #
NAS 1.26:174256 ..... N85-15798* #
NAS 1.26:174257 ..... N85-16302* #
NAS 1.26:174258 ..... N85-16059* #
NAS 1.26:174259 ..... N85-16295* #
NAS 1.26:174260 ..... N85-15991* #
NAS 1.26:174261 ..... N85-16601* #
NAS 1.26:174262 ..... N85-16649* #
NAS 1.26:174263 ..... N85-16298* #
NAS 1.26:174264 ..... N85-15819* #
NAS 1.26:174265 ..... N85-16297* #
NAS 1.26:174266 ..... N85-16293* #
NAS 1.26:174268 ..... N85-15944* #
NAS 1.26:174269 ..... N85-15990* #
NAS 1.26:174270 ..... N85-16294* #
NAS 1.26:174271 ..... N85-15701* #
NAS 1.26:174272 ..... N85-16491* #
NAS 1.26:174273 ..... N85-15992* #
NAS 1.26:174274 ..... N85-16296* #
NAS 1.26:174275 ..... N85-15989* #
NAS 1.26:174276 ..... N85-15875* #
NAS 1.26:174277 ..... N85-16586* #
NAS 1.26:174278 ..... N85-16101* #
NAS 1.26:174280 ..... N85-15759* #
NAS 1.26:174281 ..... N85-15943* #
NAS 1.26:174283 ..... N85-16078* #
NAS 1.26:174284 ..... N85-15916* #
NAS 1.26:174285 ..... N85-16656 #
NAS 1.26:174286 ..... N85-16639* #
NAS 1.26:174299 ..... N85-15690* #
NAS 1.26:174300 ..... N85-16636* #
NAS 1.26:174689 ..... N85-16698* #
NAS 1.26:174695 ..... N85-15892* #
NAS 1.26:174732 ..... N85-16291* #
NAS 1.26:174740 ..... N85-15877* #
NAS 1.26:174783 ..... N85-16699* #
NAS 1.26:174801 ..... N85-16292* #
NAS 1.26:174807 ..... N85-15604* #
NAS 1.26:174837 ..... N85-15895* #
NAS 1.26:174838 ..... N85-15728* #
NAS 1.26:175269 ..... N85-15774* #
NAS 1.26:175272 ..... N85-16159* #
NAS 1.26:177322 ..... N85-16470* #
NAS 1.26:177323 ..... N85-16471* #
NAS 1.26:177324 ..... N85-16472* #
NAS 1.26:177329 ..... N85-16473* #
NAS 1.55:2356 ..... N85-16343* #
NAS 1.60:2213 ..... N85-16065* #
NAS 1.60:2365 ..... N85-15778* #
NAS 1.60:2373 ..... N85-16066* #
NAS 1.60:2385 ..... N85-15694* #
NAS 1.60:2389 ..... N85-16565* #
NAS 1.60:2414 ..... N85-15693* #
NAS 1.60:2419 ..... N85-16099* #
NAS 1.60:2424 ..... N85-16100* #
NAS 1.60:2425 ..... N85-16351* #

NAS-MD-790 ..... N85-15705 #

NASA-CP-2356 ..... N85-16343* #

NASA-CR-3840 ..... N85-15714* #
NASA-CR-3851 ..... N85-16195* #
NASA-CR-3862 ..... N85-16589* #
NASA-CR-3863 ..... N85-15692* #
NASA-CR-3864 ..... N85-16590* #
NASA-CR-166043 ..... N85-15993* #
NASA-CR-166437 ..... N85-15717* #
NASA-CR-166601 ..... N85-16490* #
NASA-CR-166609 ..... N85-15715* #
NASA-CR-166612 ..... N85-15795* #
NASA-CR-166613 ..... N85-15793* #
NASA-CR-166614 ..... N85-15794* #
NASA-CR-166615 ..... N85-16469* #
NASA-CR-167817 ..... N85-15827* #
NASA-CR-168222 ..... N85-16300* #
NASA-CR-168259 ..... N85-15806* #
NASA-CR-169497 ..... N85-15718* #
NASA-CR-171271 ..... N85-15580* #
NASA-CR-171278 ..... N85-15772* #
NASA-CR-171281 ..... N85-16208* #
NASA-CR-171282 ..... N85-16181* #
NASA-CR-171283 ..... N85-16325* #
NASA-CR-171284 ..... N85-15766* #
NASA-CR-171289 ..... N85-15824* #
NASA-CR-171290 ..... N85-15825* #
NASA-CR-171298 ..... N85-15764* #
NASA-CR-171818 ..... N85-16243* #
NASA-CR-171819 ..... N85-16251* #
NASA-CR-171820 ..... N85-15777* #
NASA-CR-171821 ..... N85-16241* #
NASA-CR-171822 ..... N85-16242* #
NASA-CR-171823 ..... N85-16468* #
NASA-CR-171826 ..... N85-15801* #
NASA-CR-171827 ..... N85-15802* #
NASA-CR-171828 ..... N85-15803* #
NASA-CR-171831 ..... N85-16611* #
NASA-CR-172338-ADD ..... N85-15706* #
NASA-CR-172407 ..... N85-16489* #
NASA-CR-172456 ..... N85-15685* #
NASA-CR-172471 ..... N85-16098* #
NASA-CR-172477 ..... N85-15994* #
NASA-CR-172493 ..... N85-15686* #
NASA-CR-172498 ..... N85-16204* #
NASA-CR-172500 ..... N85-16525* #
NASA-CR-172503 ..... N85-16064* #
NASA-CR-172504 ..... N85-16063* #
NASA-CR-172505 ..... N85-16480* #
NASA-CR-172511 ..... N85-16588* #
NASA-CR-174188 ..... N85-16248* #
NASA-CR-174210 ..... N85-16178* #
NASA-CR-174219 ..... N85-15821* #
NASA-CR-174221 ..... N85-16244* #
NASA-CR-174225 ..... N85-16245* #
NASA-CR-174226 ..... N85-16246* #
NASA-CR-174227 ..... N85-16249* #
NASA-CR-174228 ..... N85-16250* #
NASA-CR-174229 ..... N85-16268* #
NASA-CR-174230 ..... N85-16269* #
NASA-CR-174231 ..... N85-16270* #
NASA-CR-174232 ..... N85-16271* #
NASA-CR-174242 ..... N85-16272* #
NASA-CR-174246 ..... N85-15724* #
NASA-CR-174247 ..... N85-16622* #
NASA-CR-174248 ..... N85-16621* #
NASA-CR-174249 ..... N85-16095* #
NASA-CR-174250 ..... N85-16060* #
NASA-CR-174252 ..... N85-16323* #
NASA-CR-174256 ..... N85-15798* #
NASA-CR-174257 ..... N85-16302* #
NASA-CR-174258 ..... N85-16059* #
NASA-CR-174259 ..... N85-16295* #
NASA-CR-174260 ..... N85-15991* #
NASA-CR-174261 ..... N85-16601* #
NASA-CR-174262 ..... N85-16649* #
NASA-CR-174263 ..... N85-16298* #
NASA-CR-174264 ..... N85-15819* #
NASA-CR-174265 ..... N85-16297* #
NASA-CR-174266 ..... N85-16293* #
NASA-CR-174268 ..... N85-15944* #
NASA-CR-174269 ..... N85-15990* #
NASA-CR-174270 ..... N85-16294* #
NASA-CR-174271 ..... N85-15701* #
NASA-CR-174272 ..... N85-16491* #
NASA-CR-174273 ..... N85-15992* #
NASA-CR-174274 ..... N85-16296* #
NASA-CR-174275 ..... N85-15989* #
NASA-CR-174276 ..... N85-15875* #
NASA-CR-174277 ..... N85-16586* #
NASA-CR-174278 ..... N85-16101* #
NASA-CR-174280 ..... N85-15759* #
NASA-CR-174281 ..... N85-15943* #
NASA-CR-174283 ..... N85-16078* #
NASA-CR-174284 ..... N85-15916* #
NASA-CR-174285 ..... N85-16656 #
NASA-CR-174286 ..... N85-16639* #
NASA-CR-174299 ..... N85-15690* #
NASA-CR-174300 ..... N85-16636* #
NASA-CR-174689 ..... N85-16698* #
NASA-CR-174695 ..... N85-15892* #
NASA-CR-174732 ..... N85-16291* #
NASA-CR-174740 ..... N85-15877* #
NASA-CR-174783 ..... N85-16699* #
NASA-CR-174801 ..... N85-16292* #
NASA-CR-174807 ..... N85-15804* #
NASA-CR-174837 ..... N85-15895* #
NASA-CR-174838 ..... N85-15728* #
NASA-CR-175269 ..... N85-15774* #
NASA-CR-175272 ..... N85-16159* #
NASA-CR-177322 ..... N85-16470* #
NASA-CR-177323 ..... N85-16471* #
NASA-CR-177324 ..... N85-16472* #
NASA-CR-177329 ..... N85-16473* #

NASA-SP-481 ..... N85-16665* #

NASA-TM-77292 ..... N85-16180* #
NASA-TM-77429 ..... N85-15898* #
NASA-TM-77440 ..... N85-16421* #
NASA-TM-77468 ..... N85-15988* #
NASA-TM-77475 ..... N85-15942* #
NASA-TM-77498 ..... N85-16648* #
NASA-TM-77501 ..... N85-15826* #
NASA-TM-77517 ..... N85-16422* #
NASA-TM-77624 ..... N85-15765* #
NASA-TM-77726 ..... N85-15805* #
NASA-TM-77751 ..... N85-16207* #
NASA-TM-77752 ..... N85-15876* #
NASA-TM-77753 ..... N85-15879* #
NASA-TM-77754 ..... N85-15835* #
NASA-TM-77760 ..... N85-16697* #
NASA-TM-77762 ..... N85-15684* #
NASA-TM-77773 ..... N85-16206* #
NASA-TM-77779 ..... N85-16301* #
NASA-TM-77784 ..... N85-16637* #
NASA-TM-77787 ..... N85-15836* #
NASA-TM-77794 ..... N85-15837* #
NASA-TM-77805 ..... N85-15834* #
NASA-TM-83096 ..... N85-16730* #
NASA-TM-83711 ..... N85-15896* #
NASA-TM-83748 ..... N85-15658* #
NASA-TM-84302 ..... N85-15716* #
NASA-TM-84583 ..... N85-15696* #
NASA-TM-84589 ..... N85-15697* #
NASA-TM-84914 ..... N85-15713* #
NASA-TM-85674 ..... N85-15695* #
NASA-TM-85905 ..... N85-15752* #
NASA-TM-85916 ..... N85-15729* #
NASA-TM-85920 ..... N85-15687* #
NASA-TM-85924 ..... N85-15756* #
NASA-TM-86150 ..... N85-16726* #
NASA-TM-86167 ..... N85-16273* #
NASA-TM-86173 ..... N85-16729* #
NASA-TM-86274 ..... N85-15755* #
NASA-TM-86296 ..... N85-16567* #
NASA-TM-86312 ..... N85-16728* #
NASA-TM-86325 ..... N85-16062* #
NASA-TM-86336 ..... N85-15796* #
NASA-TM-86341 ..... N85-15894* #
NASA-TM-86345 ..... N85-15657* #
NASA-TM-86356 ..... N85-15691* #
NASA-TM-86460 ..... N85-15773* #
NASA-TM-86486 ..... N85-16320* #
NASA-TM-86663 ..... N85-16724* #
NASA-TM-86685 ..... N85-16663* #
NASA-TM-86896 ..... N85-15725* #
NASA-TM-86898 ..... N85-16096* #
NASA-TM-86905 ..... N85-15878* #
NASA-TM-86907 ..... N85-15779* #
NASA-TM-86908 ..... N85-16205* #
NASA-TM-86909 ..... N85-15823* #
NASA-TM-86911 ..... N85-15727* #
NASA-TM-86912 ..... N85-15688* #
NASA-TM-86914 ..... N85-15689* #
NASA-TM-86915 ..... N85-15893* #
NASA-TM-86918 ..... N85-16299* #
NASA-TM-86919 ..... N85-15757* #
NASA-TM-86920 ..... N85-15758* #
NASA-TM-86923 ..... N85-15726* #
NASA-TM-86924 ..... N85-15822* #
NASA-TM-86925 ..... N85-15702* #
NASA-TM-86927 ..... N85-15697* #
NASA-TM-87405 ..... N85-16247* #

NASA-TP-2213 ..... N85-16065* #
NASA-TP-2365 ..... N85-15778* #
NASA-TP-2373 ..... N85-16066* #
NASA-TP-2385 ..... N85-15694* #
NASA-TP-2389 ..... N85-16565* #
NASA-TP-2414 ..... N85-15693* #
NASA-TP-2419 ..... N85-16099* #
NASA-TP-2424 ..... N85-16100* #
NASA-TP-2425 ..... N85-16351* #

NBDL-84R007 ..... N85-16451 #

NBS-GCR-84-464 ..... N85-16518 #

NBS-TN-1200 ..... N85-16519 #

NBSIR-84/2830 ..... N85-16090 #
NBSIR-84/2836 ..... N85-16517 #
NBSIR-84/2859 ..... N85-16668 #
NBSIR-84/2911 ..... N85-16148 #
NBSIR-84/2932-PT-2 ..... N85-16089 #
NBSIR-84/3004 ..... N85-16147 #
NBSIR-84/3005 ..... N85-15977 #
NBSIR-84/3011 ..... N85-15918 #

NCEL-CR-84.030 ..... N85-16532 #
NCEL-CR-84.032 ..... N85-16492 #
NCEL-CR-84.033 ..... N85-16209 #

NCEL-TN-1694 ..... N85-15909 #
NCEL-TN-1699 ..... N85-16509 #

NCTRF-158 ..... N85-15901 #

NEDU-7-84 ..... N85-16186 #

NESDIS-ENVIRON-INVENT-2 ..... N85-16415 #

NIADDK-80/301 ..... N85-16461 #

NIH/PUB-84-109 ..... N85-16461 #

NLR-MP-83054-U ..... N85-16310 #
NLR-MP-83055-U ..... N85-16311 #

NMRI-TR-84-42 ..... N85-16425 #

NMRI-84-20 ..... N85-16443 #

NOAA-TM-NWS-WR-182 ..... N85-16410 #

NOAA-84062502 ..... N85-15976 #

NOAA/TM-OAO-3 ..... N85-15976 #

NORDA-TN-283 ..... N85-16281 #
NORDA-TN-291 ..... N85-16282 #

NORSAR-SCIENTIFIC-2-83/84 ..... N85-16326 #

NOSC/TD-740 ..... N85-15950 #

NOSC/TR-992 ..... N85-16452 #

NP-18708 ..... N85-15968* #
NP-4901335 ..... N85-16283 #

NPS52-84-014 ..... N85-16481 #
NPS53-85-0001 ..... N85-16570 #
NPS55-84-015 ..... N85-16536 #
NPS55-84-016 ..... N85-16679 #
NPS55-84-020 ..... N85-16558 #
NPS69-84-006 ..... N85-16079 #

NRL-MR-5173 ..... N85-16638 #
NRL-MR-5360 ..... N85-15965 #
NRL-MR-5397 ..... N85-16335 #
NRL-MR-5410 ..... N85-16514 #
NRL-MR-5420 ..... N85-16210 #
NRL-MR-5426 ..... N85-16071 #
NRL-MR-5428 ..... N85-16383 #
NRL-MR-5434 ..... N85-16639* #
NRL-MR-5436 ..... N85-16328 #
NRL-MR-5440 ..... N85-16166 #
NRL-MR-5446 ..... N85-15957 #
NRL-MR-5474 ..... N85-16337 #

NRL-8841 ..... N85-15956 #
NRL-8843 ..... N85-15967 #
NRL-8849 ..... N85-15955 #

NSTL/ERL-230 ..... N85-16247* #

NSWC/TR-83-508 ..... N85-16305 #

NWC-TP-6558 ..... N85-16338 #

OEFZS-4274 ..... N85-16144 #
OEFZS-4276 ..... N85-16613 #
OEFZS-4277 ..... N85-16322 #
OEFZS-4287 ..... N85-16614 #
OEFZS-7281 ..... N85-16615 #

ONERA-NT-1976-5 ..... N85-16648* #

ONRL-R-10-84 ..... N85-16482 #

ORC-83-11 ..... N85-16545 #

OTA-STI-241 ..... N85-15781 #

PAR-84-116 ..... N85-16479 #

PARGUM-84-02 ..... N85-16592 #

PB84-217033 ..... N85-16517 #
PB84-217124 ..... N85-16518 #
PB84-230648 ..... N85-16461 #
PB84-235704 ..... N85-15977 #
PB84-235894 ..... N85-16147 #
PB84-240506 ..... N85-16268 #
PB84-240936 ..... N85-16519 #
PB84-243773 ..... N85-15976 #
PB84-245745 ..... N85-16688 #
PB84-245752 ..... N85-16090 #

PB84-246382 ..... N85-16146 #
PB85-100451/GAR ..... N85-16148 #
PB85-100550 ..... N85-16341 #
PB85-100717/GAR ..... N85-16013 #
PB85-100931/GAR ..... N85-15928 #
PB85-100949/GAR ..... N85-15918 #
PB85-101947/GAR ..... N85-15927 #
PB85-103612/GAR ..... N85-16463 #
PB85-104065/GAR ..... N85-16089 #
PB85-104149/GAR ..... N85-16289 #
PB85-104388/GAR ..... N85-16462 #
PB85-105617/GAR ..... N85-16290 #
PB85-105781/GAR ..... N85-16286 #
PB85-106276/GAR ..... N85-16410 #
PB85-106458/GAR ..... N85-16415 #
PB85-107233/GAR ..... N85-15768 #
PB85-113397/GAR ..... N85-16287 #
PB85-113421/GAR ..... N85-15925 #

PMTC-TP000025 ..... N85-15780 #

POLY-MRI-1432-83 ..... N85-16007 #

PR-5 ..... N85-16068 #

PSC-84-37:8362 ..... N85-15914 #

PUBL-154 ..... N85-15942* #

PWA-FR-17658 ..... N85-15922 #

PWA/GPD/FR-17952 ..... N85-15731 #

QPR-1 ..... N85-15772* #

QRDSR-7 ..... N85-16331 #

QSTPR-8 ..... N85-16268* #

RADC-TR-84-17 ..... N85-16657 #
RADC-TR-84-45 ..... N85-15962 #
RADC-TR-84-53-VOL-1 ..... N85-16498 #
RADC-TR-84-90 ..... N85-16494 #
RADC-TR-84-116 ..... N85-15972 #
RADC-TR-84-140 ..... N85-15961 #
RADC-TR-84-155 ..... N85-16632 #
RADC-TR-84-160 ..... N85-15964 #

RAE-TM-RAD-NAV-243 ..... N85-15708 #

RAE-TRANS-2120 ..... N85-15712 #
RAE-TRANS-2122 ..... N85-16600 #

RAND/N-2163-AF ..... N85-16685 #

RAND/R-3093-MIL ..... N85-16667 #

RE-690 ..... N85-15685* #
RE-691 ..... N85-15880* #
RE-692 ..... N85-15824* #
RE-693 ..... N85-15825* #

REPT-1 ..... N85-15876* #
REPT-06-6177-VOL-1 ..... N85-16449 #
REPT-18-2705-124F ..... N85-16605 #
REPT-31 ..... N85-15995 #
REPT-84-1-ONR ..... N85-16006 #
REPT-101-43-16-APP ..... N85-16689 #
REPT-229 ..... N85-16413 #
REPT-1984-1 ..... N85-16656 #
REPT-3285-2-15.2 ..... N85-16505 #
REPT-61270-10 ..... N85-16098* #
REPT-85053 ..... N85-16724* #

RFP763340/714952 ..... N85-16195* #

RJ-4472(48260) ..... N85-16170 #

ROE-OR-14 ..... N85-16102 #

RPI-MATH-144 ..... N85-16597 #

RPI-TR-MP-83 ..... N85-16179 #

RR-84-31 ..... N85-16501 #

RS-238/84 ..... N85-16613 #
RS-242/84 ..... N85-16614 #

RSL-TR-3311-2 ..... N85-15960 #

RTI/2467 ..... N85-15706* #

R84-916161-14 ..... N85-15892* #

SANDVIK-12R72 ..... N85-15880

SAR-3 ..... N85-16095* #

SC5261.6SAR ..... N85-16329 #

SD-TR-84-30 ..... N85-16405 #
SD-TR-84-36 ..... N85-15952 #
SD-TR-84-37 ..... N85-16167 #
SD-TR-84-43 ..... N85-15966 #
SD-TR-84-50 ..... N85-16339 #

SPC-789 ..... N85-15717* #

SR-1 ..... N85-16280 #
SR-1 ..... N85-16334 #

SRA-R84-910004-1 ..... N85-16070 #

SRD-83-065 ..... N85-15964 #

SRO-005-3 ..... N85-16006 #

STR-2 ..... N85-16329 #

SU-CLASSIC-84-07 ..... N85-16084 #

SU-CLASSIS-84-06 ..... N85-16078* #

SVHSER-7236-REV-A ..... N85-16468* #

SWA-84/037 ..... N85-16516 #

TPRL-406 ..... N85-16664 #

TR-D-70-ARO ..... N85-16527 #
TR-D-73-ARO ..... N85-16529 #

TR-2 ..... N85-15908 #
TR-4 ..... N85-15838 #
TR-5 ..... N85-16661 #
TR-10 ..... N85-16572 #
TR-15 ..... N85-15850 #
TR-15 ..... N85-15899 #
TR-17 ..... N85-16214 #
TR-25 ..... N85-15915 #
TR-43 ..... N85-16567 #
TR-53 ..... N85-16537 #
TR-72 ..... N85-16568 #
TR-73 ..... N85-16581 #
TR-74 ..... N85-16577 #
TR-75 ..... N85-16560 #
TR-77 ..... N85-16578 #
TR-84-5 ..... N85-16542 #
TR-009 ..... N85-15902 #
TR-107 ..... N85-16566 #
TR-699 ..... N85-15769 #
TR-0084(4478-32)-1 ..... N85-16405 #
TR-0084(4610)-1 ..... N85-16167 #
TR-0084(4764)-3 ..... N85-15952 #
TR-0084(4925-07)-1 ..... N85-15966 #
TR-0084(4940-06)-4 ..... N85-16339 #
TR-1867-03 ..... N85-16681 #

T6357/BG/WH782/84 ..... N85-16319

U-6794 ..... N85-16334 #

UAH-TR-83/11 ..... N85-16692 #

UC-25 ..... N85-15766* #

UCRL-15644 ..... N85-16457 #
UCRL-91531 ..... N85-16188 #

UCT/DEECS/TR-84-11 ..... N85-16579 #

UDR-TM-84-35 ..... N85-15862 #

UIEC-84-3 ..... N85-16005 #

UILU-ENG-84-2555 ..... N85-16005 #

UMASS-ARF-83-333 ..... N85-16336 #

UROCHESTER/DC/84/TR-57 ..... N85-16172 #

US-PATENT-APPL-SN-171913 ..... N85-15985
US-PATENT-APPL-SN-258704 ..... N85-15979
US-PATENT-APPL-SN-260878 ..... N85-16648
US-PATENT-APPL-SN-265129 ..... N85-16151
US-PATENT-APPL-SN-269455 ..... N85-15983
US-PATENT-APPL-SN-270747 ..... N85-15982
US-PATENT-APPL-SN-272881 ..... N85-16176
US-PATENT-APPL-SN-286099 ..... N85-16152
US-PATENT-APPL-SN-289860 ..... N85-16155
US-PATENT-APPL-SN-320893 ..... N85-15710
US-PATENT-APPL-SN-324907 ..... N85-15938

US-PATENT-APPL-SN-339204 N85-15711
US-PATENT-APPL-SN-343041 N85-16619
US-PATENT-APPL-SN-343136 N85-15833
US-PATENT-APPL-SN-347219 N85-15861
US-PATENT-APPL-SN-353981 N85-16618
US-PATENT-APPL-SN-353983 N85-15936
US-PATENT-APPL-SN-355952 N85-16094
US-PATENT-APPL-SN-356814 N85-16163 #
US-PATENT-APPL-SN-366787 N85-16617
US-PATENT-APPL-SN-372341 N85-15890
US-PATENT-APPL-SN-372364 N85-16157
US-PATENT-APPL-SN-375622 N85-15939
US-PATENT-APPL-SN-382068 N85-16620
US-PATENT-APPL-SN-382324 N85-16156
US-PATENT-APPL-SN-388563 N85-15980
US-PATENT-APPL-SN-394945 N85-16442
US-PATENT-APPL-SN-405772 N85-15889
US-PATENT-APPL-SN-406428 N85-16093
US-PATENT-APPL-SN-411946 N85-15940
US-PATENT-APPL-SN-418867 N85-16154
US-PATENT-APPL-SN-422429 N85-16156
US-PATENT-APPL-SN-431435 N85-15723
US-PATENT-APPL-SN-431981 N85-16616
US-PATENT-APPL-SN-434647 N85-16647
US-PATENT-APPL-SN-435156 N85-16585
US-PATENT-APPL-SN-437092 N85-15754
US-PATENT-APPL-SN-440687 N85-15874
US-PATENT-APPL-SN-441814 N85-16467
US-PATENT-APPL-SN-441816 N85-15986
US-PATENT-APPL-SN-449822 N85-15721
US-PATENT-APPL-SN-451893 N85-15891
US-PATENT-APPL-SN-453631 N85-16584
US-PATENT-APPL-SN-459073 N85-16003 #
US-PATENT-APPL-SN-459159 N85-15984
US-PATENT-APPL-SN-465230 N85-15700
US-PATENT-APPL-SN-482375 N85-15799
US-PATENT-APPL-SN-482754 N85-16342
US-PATENT-APPL-SN-486598 N85-16177
US-PATENT-APPL-SN-502717 N85-15704
US-PATENT-APPL-SN-504183 N85-15941
US-PATENT-APPL-SN-518590 N85-16153
US-PATENT-APPL-SN-519421 N85-15761 #
US-PATENT-APPL-SN-548047 N85-16183 #
US-PATENT-APPL-SN-552552 N85-15818
US-PATENT-APPL-SN-575425 N85-16165 #
US-PATENT-APPL-SN-580395 N85-15937
US-PATENT-APPL-SN-580510 N85-15935
US-PATENT-APPL-SN-596784 N85-15904 #
US-PATENT-APPL-SN-601516 N85-15839 #
US-PATENT-APPL-SN-609940 N85-15905 #
US-PATENT-APPL-SN-612528 N85-16164 #
US-PATENT-APPL-SN-617659 N85-16629 #
US-PATENT-APPL-SN-620646 N85-16604 #
US-PATENT-APPL-SN-622370 N85-16002 #
US-PATENT-APPL-SN-627939 N85-16628 #
US-PATENT-APPL-SN-629865 N85-16307 #
US-PATENT-APPL-SN-630049 N85-16001 #
US-PATENT-APPL-SN-635693 N85-16627 #
US-PATENT-APPL-SN-640624 N85-16695 #
US-PATENT-APPL-SN-640902 N85-15971 #
US-PATENT-APPL-SN-640904 N85-15970 #
US-PATENT-APPL-SN-640916 N85-15884 #
US-PATENT-APPL-SN-643139 N85-16635 #
US-PATENT-APPL-SN-643140 N85-15797 #
US-PATENT-APPL-SN-643327 N85-16653 #
US-PATENT-APPL-SN-645389 N85-15911 #
US-PATENT-APPL-SN-645390 N85-16459 #
US-PATENT-APPL-SN-645468 N85-16010 #
US-PATENT-APPL-SN-647781 N85-16009 #
US-PATENT-APPL-SN-647782 N85-16142 #
US-PATENT-APPL-SN-653116 N85-15845 #
US-PATENT-APPL-SN-655114 N85-16304 #
US-PATENT-APPL-SN-656208 N85-16141 #
US-PATENT-APPL-SN-664267 N85-16596 #

US-PATENT-CLASS-52-208 N85-15890
US-PATENT-CLASS-60-752 N85-16647
US-PATENT-CLASS-65-40 N85-15891
US-PATENT-CLASS-73-171 N85-16342
US-PATENT-CLASS-73-642 N85-16584
US-PATENT-CLASS-89-1A N85-15940
US-PATENT-CLASS-128-303 N85-16442
US-PATENT-CLASS-148-403 N85-15874
US-PATENT-CLASS-244-3.2 N85-15704
US-PATENT-CLASS-244-223 N85-15721
US-PATENT-CLASS-248-75 N85-16177
US-PATENT-CLASS-250-201 N85-16619
US-PATENT-CLASS-250-227 N85-16094
US-PATENT-CLASS-250-578 N85-16617
US-PATENT-CLASS-260-544B N85-15818
US-PATENT-CLASS-297-406 N85-15710
US-PATENT-CLASS-310-334 N85-16585
US-PATENT-CLASS-315-39.71 N85-16154
US-PATENT-CLASS-324-73PC N85-15938
US-PATENT-CLASS-328-55 N85-15985
US-PATENT-CLASS-330-279 N85-15982
US-PATENT-CLASS-331-3 N85-16151
US-PATENT-CLASS-331-107 N85-15979
US-PATENT-CLASS-333-116 N85-15936
US-PATENT-CLASS-333-156 N85-15986
US-PATENT-CLASS-333-206 N85-15984
US-PATENT-CLASS-340-347 N85-15983
US-PATENT-CLASS-343-754 N85-15980
US-PATENT-CLASS-343-826 N85-15981
US-PATENT-CLASS-350-96.19 N85-15939
US-PATENT-CLASS-350-394 N85-16620
US-PATENT-CLASS-350-538 N85-16467
US-PATENT-CLASS-356-352 N85-16152
US-PATENT-CLASS-356-359 N85-16156
US-PATENT-CLASS-357-6 N85-16646
US-PATENT-CLASS-361-328 N85-15941
US-PATENT-CLASS-364-433 N85-15711
US-PATENT-CLASS-370-3 N85-16616
US-PATENT-CLASS-372-38 N85-16155
US-PATENT-CLASS-372-89 N85-16158
US-PATENT-CLASS-372-95 N85-16618
US-PATENT-CLASS-374-45 N85-16157
US-PATENT-CLASS-374-121 N85-16093
US-PATENT-CLASS-375-101 N85-15935
US-PATENT-CLASS-375-101 N85-15937
US-PATENT-CLASS-403-24 N85-16176
US-PATENT-CLASS-415-138 N85-15723
US-PATENT-CLASS-422-68 N85-15833
US-PATENT-CLASS-427-162 N85-16153
US-PATENT-CLASS-428-109 N85-15754
US-PATENT-CLASS-560-221 N85-15889

US-PATENT-4-471,340 N85-15983
US-PATENT-4,404,244 N85-15754
US-PATENT-4,448,000 N85-15890
US-PATENT-4,449,105 N85-16151
US-PATENT-4,452,533 N85-16152
US-PATENT-4,452,624 N85-15891
US-PATENT-4,452,998 N85-15889
US-PATENT-4,456,889 N85-15982
US-PATENT-4,459,700 N85-15937
US-PATENT-4,462,256 N85-16584
US-PATENT-4,464,065 N85-16093
US-PATENT-4,464,702 N85-15941
US-PATENT-4,464,768 N85-15935
US-PATENT-4,465,068 N85-16442
US-PATENT-4,465,250 N85-15700
US-PATENT-4,465,253 N85-16177
US-PATENT-4,465,332 N85-15939
US-PATENT-4,465,347 N85-16467
US-PATENT-4,465,372 N85-16156
US-PATENT-4,465,392 N85-16176
US-PATENT-4,465,940 N85-16617
US-PATENT-4,465,953 N85-16154
US-PATENT-4,465,985 N85-15936
US-PATENT-4,465,988 N85-15986
US-PATENT-4,466,003 N85-15981
US-PATENT-4,466,100 N85-16158
US-PATENT-4,466,662 N85-15710
US-PATENT-4,467,186 N85-16619
US-PATENT-4,467,429 N85-15711
US-PATENT-4,468,624 N85-15985
US-PATENT-4,468,635 N85-15979
US-PATENT-4,468,766 N85-16616
US-PATENT-4,469,536 N85-15874
US-PATENT-4,469,977 N85-16585
US-PATENT-4,470,562 N85-15704
US-PATENT-4,471,219 N85-16094
US-PATENT-4,471,359 N85-15980
US-PATENT-4,471,623 N85-16647
US-PATENT-4,471,683 N85-15940
US-PATENT-4,472,356 N85-15833
US-PATENT-4,472,679 N85-15938
US-PATENT-4,472,726 N85-16646
US-PATENT-4,472,807 N85-16155
US-PATENT-4,476,062 N85-15818
US-PATENT-4,476,161 N85-16153
US-PATENT-4,476,718 N85-16342
US-PATENT-4,477,024 N85-15799
US-PATENT-4,477,043 N85-15721
US-PATENT-4,477,152 N85-16620
US-PATENT-4,477,222 N85-15723
US-PATENT-4,477,787 N85-15984
US-PATENT-4,477,909 N85-16618
US-PATENT-4,479,222 N85-16157

USAAEFA-82-15-1 N85-15719 #

USAAVSCOM-TR-84-C-12 N85-15658* #
USAAVSCOM-TR-84-C-16 N85-15727* #

USACSTA-6045 N85-16140 #

USAFETAC/DS-78/012 N85-16388 #
USAFETAC/DS-79/038-REV N85-16396 #
USAFETAC/DS-79/060 N85-16394 #
USAFETAC/DS-79/095 N85-16386 #
USAFETAC/DS-79/100 N85-16384 #
USAFETAC/DS-79/102 N85-16392 #
USAFETAC/DS-80/029 N85-16390 #
USAFETAC/DS-80/052 N85-16395 #
USAFETAC/DS-80/091 N85-16387 #
USAFETAC/DS-81/051 N85-16389 #
USAFETAC/DS-81/063 N85-16391 #
USAFETAC/DS-84/014 N85-16384 #
USAFETAC/DS-84/014 N85-16394 #
USAFETAC/DS-84/015 N85-16385 #
USAFETAC/DS-84/016 N85-16386 #
USAFETAC/DS-84/017 N85-16387 #
USAFETAC/DS-84/018 N85-16388 #
USAFETAC/DS-84/020 N85-16389 #
USAFETAC/DS-84/021 N85-16390 #
USAFETAC/DS-84/023 N85-16391 #
USAFETAC/DS-84/025 N85-16393 #
USAFETAC/DS-84/027 N85-16392 #
USAFETAC/DS-84/029 N85-16395 #
USAFETAC/DS-84/030 N85-16398 #
USAFETAC/DS-84/031 N85-16397 #
USAFETAC/DS-84/032 N85-16396 #
USAFETAC/DS-84/033 N85-16399 #

USAFSAM-TR-84-26 N85-16477 #

USARIEM-M-1/85 N85-16447 #

USARIEM-M2/85 N85-16448 #
USARIEM-M3/85 N85-16423 #
USARIEM-M6/85 N85-16455 #

USARIEM-T-2/84 N85-16450 #

USCG-D-21-84 N85-16449 #

UTCMSE-84-2 N85-15829 #

UTIAS-TN-251 N85-16061 #

UVA/525358/SE85/101 N85-16670 #
UVA/525393/SE84/103 N85-16534 #

UWIS/DC/TR-84/2 N85-15995 #

VTT-292 N85-16460 #

WES-INSTRUCTION-K-84-7 N85-16493 #

WES/MP/E-84-4 N85-16543 #

WHOI-84-36 N85-16412 #
WHOI-84-39 N85-16414 #

WMO-632 N85-16352 #

WU/EE-84463-1 N85-16658 #
WU/EE-84463-2 N85-16660 #

Y/DW-474 N85-16197 #
Y/DW-481 N85-16598 #

☆U.S. GOVERNMENT PRINTING OFFICE: 1985-461-597/20006

FEDERAL DEPOSITORY LIBRARY PROGRAM

The Federal Depository Library Program provides Government publications to designated libraries throughout the United States. The Regional Depository Libraries listed below receive and retain at least one copy of nearly every Federal Government publication, either in printed or microfilm form, for use by the general public. These libraries provide reference services and inter-library loans; however, they are *not* sales outlets. You may wish to ask your local library to contact a Regional Depository to help you locate specific publications, or you may contact the Regional Depository yourself.

ARKANSAS STATE LIBRARY
One Capitol Mall
Little Rock, AR 72201
(501) 371-2326

AUBURN UNIV. AT MONTGOMERY LIBRARY
Documents Department
Montgomery, AL 36193
(205) 279-9110, ext. 253

UNIV. OF ALABAMA LIBRARY
Documents Dept.—Box S
University, AL 35486
(205) 348-7369

DEPT. OF LIBRARY, ARCHIVES AND PUBLIC RECORDS
Third Floor—State Cap.
1700 West Washington
Phoenix, AZ 85007
(602) 255-4121

UNIVERSITY OF ARIZONA LIB.
Government Documents Dept.
Tucson, AZ 85721
(602) 626-5233

CALIFORNIA STATE LIBRARY
Govt. Publications Section
P.O Box 2037
Sacramento, CA 95809
(916) 322-4572

UNIV. OF COLORADO LIB.
Government Pub. Division
Campus Box 184
Boulder, CO 80309
(303) 492-8834

DENVER PUBLIC LIBRARY
Govt. Pub. Department
1357 Broadway
Denver, CO 80203
(303) 571-2131

CONNECTICUT STATE LIBRARY
Government Documents Unit
231 Capitol Avenue
Hartford, CT 06106
(203) 566-4971

UNIV. OF FLORIDA LIBRARIES
Library West
Documents Department
Gainesville, FL 32611
(904) 392-0367

UNIV. OF GEORGIA LIBRARIES
Government Reference Dept.
Athens, Ga 30602
(404) 542-8951

UNIV. OF HAWAII LIBRARY
Govt. Documents Collection
2550 The Mall
Honolulu, HI 96822
(808) 948-8230

UNIV. OF IDAHO LIBRARY
Documents Section
Moscow, ID 83843
(208) 885-6344

ILLINOIS STATE LIBRARY
Information Services Branch
Centennial Building
Springfield, IL 62706
(217) 782-5185

INDIANA STATE LIBRARY
Serials Documents Section
140 North Senate Avenue
Indianapolis, IN 46204
(317) 232-3686

UNIV. OF IOWA LIBRARIES
Govt. Documents Department
Iowa City, IA 52242
(319) 353-3318

UNIVERSITY OF KANSAS
Doc. Collect—Spencer Lib.
Lawrence, KS 66045
(913) 864-4662

UNIV. OF KENTUCKY LIBRARIES
Govt. Pub. Department
Lexington, KY 40506
(606) 257-3139

LOUISIANA STATE UNIVERSITY
Middleton Library
Govt. Docs. Dept.
Baton Rouge, LA 70803
(504) 388-2570

LOUISIANA TECHNICAL UNIV. LIBRARY
Documents Department
Ruston, LA 71272
(318) 257-4962

UNIVERSITY OF MAINE
Raymond H. Fogler Library
Tri-State Regional Documents Depository
Orono, ME 04469
(207) 581-1680

UNIVERSITY OF MARYLAND
McKeldin Lib.—Doc. Div.
College Park, MD 20742
(301) 454-3034

BOSTON PUBLIC LIBRARY
Government Docs. Dept.
Boston, MA 02117
(617) 536-5400 ext. 226

DETROIT PUBLIC LIBRARY
Sociology Department
5201 Woodward Avenue
Detroit, MI 48202
(313) 833-1409

MICHIGAN STATE LIBRARY
P.O. Box 30007
Lansing, MI 48909
(517) 373-0640

UNIVERSITY OF MINNESOTA
Government Pubs. Division
409 Wilson Library
309 19th Avenue South
Minneapolis, MN 55455
(612) 373-7813

UNIV. OF MISSISSIPPI LIB.
Documents Department
University, MS 38677
(601) 232-5857

UNIV. OF MONTANA
Mansfield Library
Documents Division
Missoula, MT 59812
(406) 243-6700

NEBRASKA LIBRARY COMM.
Federal Documents
1420 P Street
Lincoln, NE 68508
(402) 471-2045
In cooperation with University of Nebraska-Lincoln

UNIVERSITY OF NEVADA LIB.
Govt. Pub. Department
Reno, NV 89557
(702) 784-6579

NEWARK PUBLIC LIBRARY
5 Washington Street
Newark, NJ 07101
(201) 733-7812

UNIVERSITY OF NEW MEXICO
Zimmerman Library
Government Pub. Dept.
Albuquerque, NM 87131
(505) 277-5441

NEW MEXICO STATE LIBRARY
Reference Department
325 Don Gaspar Avenue
Santa Fe, NM 87501
(505) 827-2033, ext. 22

NEW YORK STATE LIBRARY
Empire State Plaza
Albany, NY 12230
(518) 474-5563

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
Wilson Library
BA/SS Documents Division
Chapel Hill, NC 27515
(919) 962-1321

UNIVERSITY OF NORTH DAKOTA
Chester Fritz Library
Documents Department
Grand Forks, ND 58202
(701) 777-2617, ext. 27
(In cooperation with North Dakota State Univ. Library)

STATE LIBRARY OF OHIO
Documents Department
65 South Front Street
Columbus, OH 43215
(614) 462-7051

OKLAHOMA DEPT. OF LIB.
Government Documents
200 NE 18th Street
Oklahoma City, OK 73105
(405) 521-2502

OKLAHOMA STATE UNIV. LIB.
Documents Department
Stillwater, OK 74078
(405) 624-6546

PORTLAND STATE UNIV. LIB.
Documents Department
P.O. Box 1151
Portland, OR 97207
(503) 229-3673

STATE LIBRARY OF PENN.
Government Pub. Section
P.O. Box 1601
Harrisburg, PA 17105
(717) 787-3752

TEXAS STATE LIBRARY
Public Services Department
P.O. Box 12927—Cap. Sta.
Austin, TX 78753
(512) 471-2996

TEXAS TECH UNIV. LIBRARY
Govt. Documents Department
Lubbock, TX 79409
(806) 742-2268

UTAH STATE UNIVERSITY
Merrill Library, U.M.C. 30
Logan, UT 84322
(801) 750-2682

UNIVERSITY OF VIRGINIA
Alderman Lib.—Public Doc.
Charlottesville, VA 22901
(804) 924-3133

WASHINGTON STATE LIBRARY
Documents Section
Olympia, WA 98504
(206) 753-4027

WEST VIRGINIA UNIV. LIB.
Documents Department
Morgantown, WV 26506
(304) 293-3640

MILWAUKEE PUBLIC LIBRARY
814 West Wisconsin Avenue
Milwaukee, WI 53233
(414) 278-3000

ST. HIST LIB. OF WISCONSIN
Government Pub. Section
816 State Street
Madison, WI 53706
(608) 262-4347

WYOMING STATE LIBRARY
Supreme Ct. & Library Bld.
Cheyenne, WY 82002
(307) 777-6344

National Aeronautics and
Space Administration
Code NIT-4
Washington, D.C.
20546

Official Business

Penalty for Private Use, $300

SPECIAL FOURTH CLASS MAIL
Book

Postage and Fees Paid
National Aeronautics and
Space Administration
NASA-451

U.S.MAIL

8 1 STAR, 850408 S00606HU
UNIV OF MICHIGAN
ENG TRANSPORATION LIBRARY
ATTN: SERIALS UNIT
312 UNDERGRADUATE LIBRARY BLDG
ANN ARBOR MI 48109

NASA

POSTMASTER: If Undeliverable (Section 158
Postal Manual) Do Not Return

C